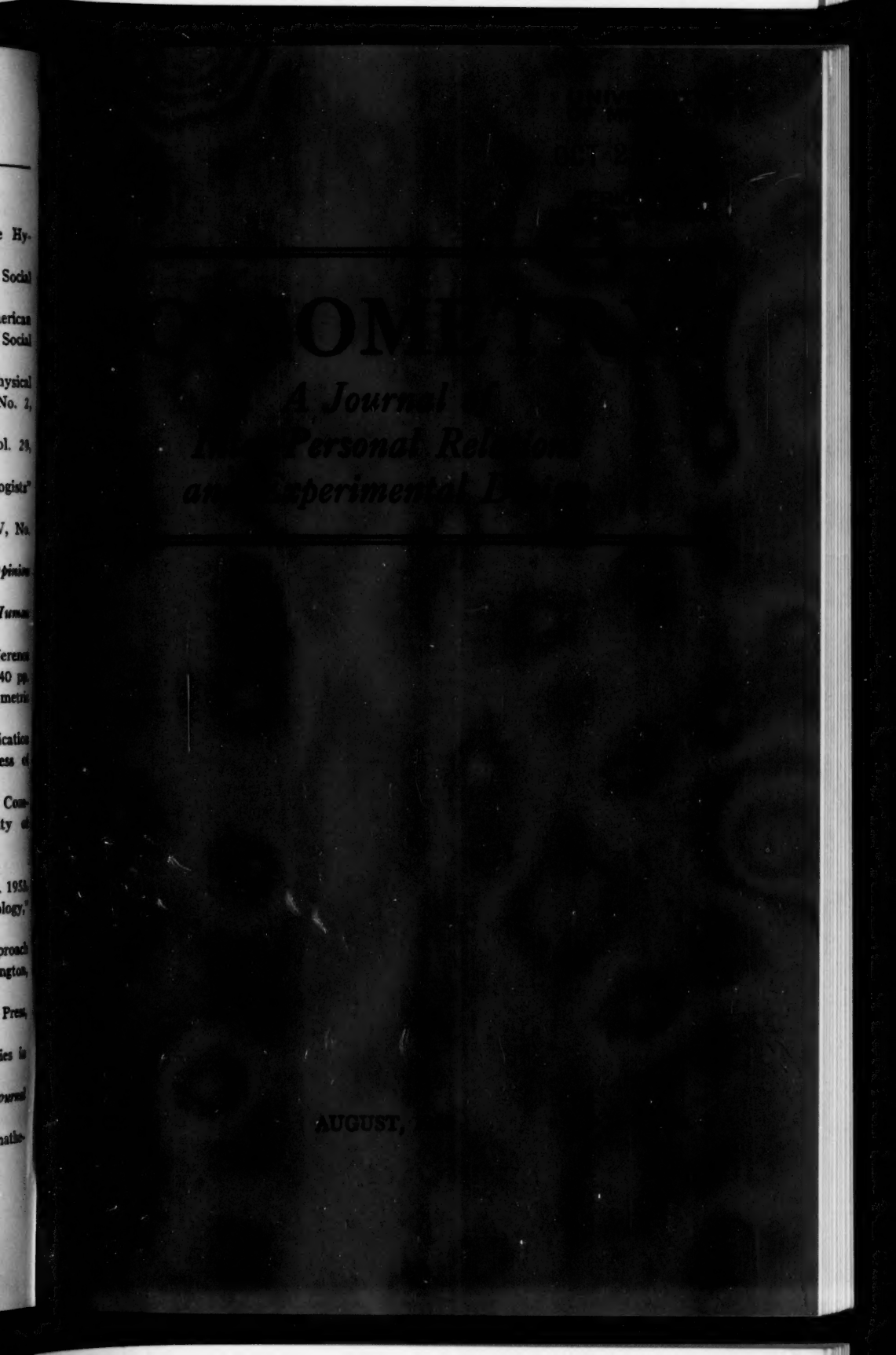
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CONTENTS

SOCIOMETRIC CHOICE AND ORGANIZATIONAL EFFECTIVENESS: A MULTI-RELATIONAL APPROACH—Fred Massarik, Robert Tannenbaum, Murray Kahane, and Irving Weschler 211

TASK AND ACCUMULATION OF EXPERIENCE AS FACTORS IN THE INTERACTION OF SMALL GROUPS—Edgar G. Borgatta and Robert F. Bales 239

THE INTERACTION-FEELING HYPOTHESIS APPLIED TO PSYCHOTHERAPY GROUPS—Robert R. Blake 253

A SCALE PATTERN OF OPINION CORRELATES: COMMUNICATION NETWORKS, MEDIA EXPOSURE, AND CONCOMITANT RESPONSES—Daniel Lerner 266

AN ANALYSIS OF THE PRIMARY GROUP—Paul H. Fischer 272

ANNOUNCEMENTS 277

SOCIOMETRIC CHOICE AND ORGANIZATIONAL EFFECTIVENESS: A MULTI-RELATIONAL APPROACH

FRED MASSARIK, ROBERT TANNENBAUM, MURRAY KAHANE, AND IRVING WESCHLER

I

INTRODUCTION

The Multi-Relational Sociometric Survey (the M.S.S.) technique[1] here reported resulted from the authors' continuing interest in human variables associated with organizational effectiveness. Specifically, this technique was developed to identify and analyze several types of interpersonal activities and relations, and to provide a method for expressing the degree of congruence between two or more of these activities and relations in indices which might be associated with available criteria of organizational effectiveness.[2]

Traditionally, discussions of organization theory have drawn a distinction between the concepts of formal and informal organization. In a survey of the relevant literature undertaken by the Human Relations Research Group, considerable disagreement was found to exist among writers as to the meaning of these two concepts. In defining formal organization, for example, some stressed the rational, prescribed relations between positions—the blueprint or organizational-chart approach—while others stressed

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[1] This is the fourth report of the Human Relations Research Group, Institute of Industrial Relations, University of California, Los Angeles, completed under a grant from the U. S. Navy, Office of Naval Research. This group is headed by Dr. Robert Tannenbaum. Special appreciation is due Mr. Eugene Talbot, Dr. Paula Brown, and Mrs. Jacqueline Gordon for their invaluable assistance in connection with the development of both the M.S.S and this article. The M.S.S. was presented in more popular form in I. R. Weschler, R. Tannenbaum, and E. Talbot, "A New Management Tool: The Multi-Relational Sociometric Survey," *Personnel*, 29 (July, 1952), 85-94. The empirical data used for illustrative purposes in the first publication as well as in the current paper were obtained in a pilot investigation conducted in two divisions of Southern California naval research and development laboratory. For the original formulations of sociometric theory and technique, see J. L. Moreno, *Who Shall Survive?* New York: Beacon House, 1934 and 1953.

[2] One difficulty involved the establishment of appropriate criteria of organizational effectiveness, particularly because our research was conducted in a laboratory, wherein effectiveness often had to be inferred indirctly from supervisors' ratings and from measures of morale, job satisfaction, and productivity *perceptions*. In another

the rational, prescribed relations between specific persons.[3] On the other hand, in defining informal organization, some included *all* relations between persons not formally prescribed; some, only spontaneously developed affective relations; some, only those relations which are extra-organizational in character (i.e., those not clearly directed toward organizational goals).[4]

From these various definitions, the main point emerges that the people who comprise any organization are related to each other in numerous ways. Further, it may be hypothesized that the degree of congruence between specific relations may have some implications for organizational effectiveness. The research problem, then, becomes that of analyzing selected types of relations, and of developing the appropriate indices showing their interrelations. Although this problem will be discussed more fully in Sections IV, V, and VI, consideration of some key concepts must precede.

Interpersonal activities among people who comprise any organization

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research project, the Human Relations Research Group is addressing itself to the clearer formulation of measures of effectiveness applicable to scientific research groups.

[3] The following illustrate some shades of meaning in the use of the concept "formal organization":

(a) "A formal, rationally organized social structure involves clearly defined patterns of activity in which, ideally, every series of actions is functionally related to the purposes of the organization. In such an organization there is an integrated series of offices, of hierarchized statuses, in which inhere a number of obligations and privileges closely defined by limited and specific rules." Robert K. Merton, "Bureaucratic Structure and Personality," in his *Social Theory and Social Structure* (Glencoe: Fress Press, 1949), p. 151.

(b) ". . . the most useful concept for the analysis of experience of cooperative systems is embodied in the definition of a formal organization as a system of consciously coordinated activities or forces of two or more persons." C. I. Barnard, *The Functions of the Executive* (Cambridge: Harvard University Press, 1947), p. 73.

[4] The following illustrate some shades of meaning, in the use of the concept "informal organization":

(a) "Informal organization is the network of personal and social relations which are not defined or prescribed by formal organization." Delbert C. Miller and William H. Form, *Industrial Sociology* (New York: Harper, 1951), p. 863.

(b) Informal organization "is composed of the animosities and friendships among the people who work together." *Ibid.*, p. 146.

(c) "By informal organization I mean the aggregate of the personal contacts and interactions and the associated groupings of people. . . . Though common or joint purposes are excluded by definition, common or joint results of important character nevertheless come from such organization . . . informal organization is indefinite and rather structureless. . . . " Barnard, *op. cit.*, p. 115.

may be divided into two main types: those clearly directed toward the attainment of organizational goals, and those not so directed. For the sake of brevity, we shall speak of the first type as "goal-directed," and of the second type as "nongoal-directed."

The first type incorporates those activities which specifically are necessary (as seen by persons in authority) to the achievement of the purposes of the organization. Order-giving, efficiency-rating, and the giving of advice and assistance in work are examples of this type. The second type incorporates those activities not directly essential to the achievement of organizational purposes. Lunching and socializing after working hours are illustrative.

Each activity includes a number of *relations*. For each of the goal-directed activities, five relations are postulated. These are the *prescribed*, the *perceived*, the *actual*, the *desired*, and the *rejected*.

1. *The prescribed relations* are defined by the official sanction of the duly-constituted leaders of the organization. (X has been delegated authority by his superior to give orders in work to Y.) These relations are either explicitly specified or implicitly accepted by persons in authority. They are explicit when they are defined by oral or written directive; they are implicit when their existence within the organization is accepted by those in authority although such existence is not based upon directive. By way of example, in all organizations prescribed order-giving is explicit; in many, however, prescribed giving-of-advice-and-assistance is implicit.

2. *The perceived relations* are defined by persons' perceptions of the prescribed relations. (For example, Y perceives Z as having authority to give him orders in work—even though it is, in fact, X who has such authority.)

3. *The actual relations* are defined by the interactions which in fact take place among persons. (For example, Y regularly receives orders in work from X.) Operationally, these relations can be revealed by two methods—by observation of behavior as it occurs, or by asking individuals to indicate the person(s) with whom they interact.[5] When the latter method

[5] Thus we might distinguish an "actual actual" to designate a relation for which data were obtained by direct observation, and a "perceived actual" for which data were obtained by asking individuals to indicate the person(s) with whom they interact. In the pilot investigation, the "perceived actual" was used, but for the sake of brevity, we shall frequently speak simply of the "actual" when referring to the "perceived actual."

is used, the replies represent perceptual data which probably correlate positively, although imperfectly, with data that might be obtained by direct observation.

The desired relations are defined by persons' preferences regarding interactions with other persons (positive affect). (For example, Y *would like to* receive orders in work from W.)

It is possible here to include *all* preferred interactions or only the one (or ones) *most* preferred. For operational purposes, a choice between these alternatives must be made.

The desired relations are equivalent to the "choices" as used in sociometry.

5. *The rejected relations* are defined by persons' adverse reactions regarding interactions with other persons (negative affect). (For example, Y *would not like* to receive orders in work from X.)

It is possible here to include *all* rejected interactions or only the one (or ones) *most* rejected.

The rejected relations are equivalent to "rejections" as used in sociometry.

In comparing the five relations discussed above, we may view the prescribed relations as organizational norms, and the perceived relations as the psychological corollaries of these organizational norms. The desired and rejected relations may either support these norms (if the prescribed is desired) or contravene these norms (if the prescribed is rejected). The actual relations may be resultants, dependent, among other things, upon the norms, awareness of these norms, and desires and rejections.

For each of the nongoal-directed activities, only three relations are postulated. These are the actual, the desired, and the rejected. Clearly, the prescribed and the perceived relations are not relevant to nongoal-directed activities.

II

Development and Administration of the Research Instrument

1. *The Setting*

The pilot investigation was conducted in a Southern California naval research and development laboratory. The subjects were primarily engineers, physicists, chemists, draftsmen, and supporting administrative and clerical specialists. Specifically, they were the members of two divisions, characterized by presumably contrasting styles of leadership. Division A

was headed by an apparently restrictive leader, while Division B was more permissively led.

Prior to the M.S.S. study, other human relations research projects had been conducted in the laboratory, and continuing contact had been maintained with its formal leadership. Thus, a degree of rapport already had been established when the current project was initiated.

2. *Specifying the Principal Activities*

In planning the M.S.S., it became necessary to specify for research purposes a sensibly small number of activities. The selection was made on a common-sense basis, buttressed by interviews with key personnel in the laboratory.[6] The following activities were chosen:

A. Goal-directed activities:
   1) being efficiency rated
   2) turning to others for advice in work
   3) being given directions or orders
   4) presenting major grievances
   5) being designated for a promotion
   6) having one's mistakes in work pointed out
   7) spending time with others during working hours[7]
   8) discussing annoyances arising from work

B. Nongoal-directed activities:
   1) socializing after working hours
   2) having lunch with others
   3) discussing personal problems

3. *Obtaining the Data*

A. The prescribed relations:
   Two sources were utilized to secure information about the prescribed relations of the goal-directed activities: (1) organizational charts and manuals, (2) interviews with top administrators and personnel specialists. These data describe what often is referred to as the "formal organization."

[6] This is essentially a type of sampling problem. One might imagine a large universe of all possible activities between individuals in a particular setting, from which a representative sample must be drawn.

[7] Some activities such as this one, are difficult to classify, as they may vary in terms of goal-direction and nongoal-direction.

B. The perceived, actual, desired, and rejected relations:
To secure facts about relations other than the prescribed, a questionnaire was constructed and administered to persons at all levels of the hierarchy. This questionnaire is the basic instrument of the M.S.S.

The following may serve as a prototype to indicate the kinds of questions used:

Goal-directed:

The perceived:	"Who is ***supposed*** to give you directions (or orders) in your work?"
The actual:	"Who ***actually*** gives you directions (or orders) in your work?"
The desired:	"If it were up to you to decide, ***whom would you*** choose to give you directions (or orders) in your work?"
The rejected:	"***Whom would you least want*** to give you directions (or orders) in your work?"

Nongoal-directed:

The actual:	"With whom *do* you usually have lunch?"
The desired:	"With whom would you *like to be able* to have lunch?"
The rejected:	"With whom would you *least like* to have lunch?"[8]

No constraints were imposed on the subjects to limit the number or nature of their responses. More than one answer was permitted, organizational units could be used as choices, and qualifying or qualitative comments could be appended to any reply. The questionnaires were completed by the respondents at their homes and mailed unsigned to the university address of the research team.[9] Code numbers were used so that only the members of the research team could identify individuals. Out of a population of 68, 66 completed questionnaires were obtained.

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[8] In some cases, the rejection relation was not included, even though it did apply. At the time of the field study, this was done for the sake of economy; but it was realized subsequently that the relevant questions should have been included.

[9] This was done as a further safeguard against the operation of direct or subtle interpersonal pressures such as might be generated by face-to-face contact among the respondents during the filling out of the questionnaire.

The need for a virtually complete return of replies in a sociometric investigation is apparent. High nonresponse would leave such gaps in the matrix as to diminish greatly the value of the data. An instrument such as the M.S.S. may represent a threat to the security of some of the respondents. Therefore, straightforward, satisfactory interpretation of the research project's objectives is essential. Feed-back of data must be handled with caution, for it too may represent a threat. In the pilot investigation, it was emphasized that the survey results would *not* be used as a basis for any sort of administrative action. In fact, it was made clear that no management person would see individual replies; all findings would be available only in such form as to protect the individuals concerned by making identification impossible.[10]

4. *Coding and Preparing the Data for Analysis*

A number had been assigned to each of the respondents, and these numbers became part of the code. Most replies did mention specific individuals, but responses such as "no one," anyone," "people near my desk," "my superiors," etc., also appeared with some frequency and were added to the code.[11]

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[10] There are certain differences between the use of the M.S.S. as a tool of management and a as research device. When used as a managerial tool, action is a logical consequence of the M.S.S. In academic research, on the other hand, considerable stress is laid on the fact that *nothing* will happen within the organization to modify existing regulations directly as a result of the findings. Clearly, this implies a different type of motivation to cooperate than if change, and particularly change-for-the-better, is promised. There is no reason to believe, however, that the sort of motivation elicited by a promise of action necessarily results in more honest or more valid data than the motivation that exists when it is emphasized that the research results will not be used directly as an instrument for change. Change, brought about indirectly by interest aroused in topics raised by the M.S.S., may nevertheless be a by-product of the research.

[11] The following illustrates some of the categories that were developed to deal with choices other than those for specific individuals:

A. unnamed persons, e.g., (1) anyone, (2) all, (3) many, (4) some, etc.
B. self-reference e.g., (1) myself, (2) alone, etc.
C. "formal" organizational units within the laboratory, e.g.,(1) Power Plant Division, etc.
D. "informal" groups, e.g., (1) by car pool, (2) the bridge group, etc.
E. Status units, e.g., (1) my superiors, (2) my subordinates, etc.
F. functional units, e.g., (1) people who can help me, (2) people who are qualified . . . (6) anyone else who can help me, etc.,

In the pilot investigation, IBM procedures were not used, although this might have been done successfully. Rather, the code designations were transferred to large general-purpose tables from which they could be converted into matrix form.

In order to facilitate analysis and interpretation, a method for organizing the raw data was needed. The method that was developed for this purpose is considered in the next section.

III

A Method for Organizing the Data

Let us recapitulate the basic concepts outlined in Section I. We distinguish two major categories of activities: the goal-directed and the nongoal-directed.[12] For each of the former, five relations are postulated: the prescribed, the perceived, the actual, the desired, and the rejected. For each of the latter type, three relations are postulated: the actual, the desired, and the rejected. The following symbols will prove useful for putting the data into matrix form:

' to indicate an instance of a prescribed relation
o to indicate an instance of a perceived relation
x to indicate an instance of an actual relation
+ to indicate an instance of a desired relation
— to indicate an instance of a rejected relation

G. physical arrangement units, e.g., (1) people near my desk, (2) people in my office, etc.

Also, qualifying remarks were coded, using categories such as the following:

H. frequency of interaction, e.g., (1) always, (2) sometimes, (3) usually, etc.

I. feeling tone of interaction, e.g., (1) friendly, (2) unfriendly, etc.

Following is an example of how a particular response may be coded:

Smith, code number 123, might have replied as follows to the question, "To whom do you turn for advice in your work?": ". . . to Jones; but sometimes I go to other people in the Power Plant Division, or to anyone else who can help me." This would be coded as follows:

Jones—code number for specific individual: 123.

"other people in Power Plant Division" (formal organizational unit)—see C above: C-1.

"sometimes" (qualifying remark for Power Plant Division)—see H above: H-2.

"anyone else who can help me" (functional unit): F-6.

The reliability of the coding was checked, and although no coefficients were calculated, it was apparent that only a trivial number of disagreements between coders appeared.

[12] The goal-directed and the nongoal-directed activities studied in the pilot investigation are listed in full on pages 6 and 7.

In conventional sociometric matrices, each cell contains information about a particular choice or relationship between two individuals in a particular activity.[13] However, in an M.S.S. matrix cell, for any goal-directed activity such as order-giving, it is possible to indicate all, some or none of the five relations shown above. Thus, an M.S.S. matrix cell contains some variant of the following:[14]

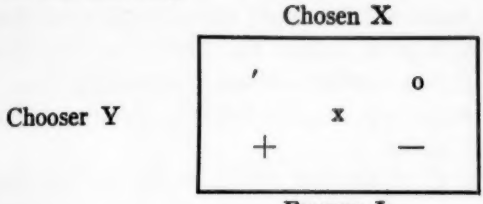


FIGURE I.

Each symbol is placed in the appropriate position within the cell, as shown in Figure I. Thus, ′ always appears in the upper left-hand corner, o in the upper right-hand corner, etc.

For example, the following pattern of relations may be found for the order-giving activity:

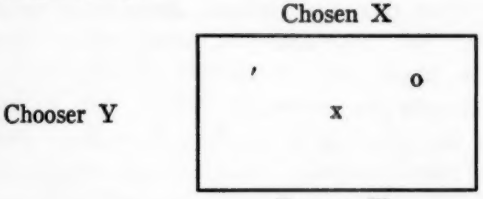


FIGURE II.

According to Figure II, Y is supposed to take orders from X (prescribed), he believes that X is supposed to give him orders (perceived), and indeed X does give him orders. However, on the affective level, Y neither desires nor rejects X as an order-giver, for we find neither a plus (+) in

[13] Conventional sociometric usage frequently employs the word "criterion" for what we call "activity." For example, see Charles H. Proctor and Charles P. Loomis, "Analysis of Sociometric Data," in Marie Jahoda, Morton Deutsch and Stuart W. Cook, *Research Methods in Social Relations, Part Two: Selected Techniques* (Springfield: Dryden, 1951), p. 562.

[14] Actually, it is unlikely that all five of the relations will be found in any one cell. Typically, one person will not be both desired and rejected by the same chooser. This is not to deny the existence of ambivalence as a personality dynamic, although most sociometric methods have not made use of this concept.

the lower left-hand corner of the cell, nor a minus(—) in the lower right-hand corner. (See positions of symbols shown in Figure I.)

A cell that is completely blank indicates that for a particular activity, no relations link the individuals concerned.

For each activity an entire matrix may be formed with the choosers arranged along the ordinate and the chosen along the abscissa.[15] In practice, it may be that more cases will fall along the abscissa than along the ordinate. This is so because a given chooser may select persons outside his own group or organizational unit; he may choose "unnamed persons" (e.g., "my friends"), or entire groups (e.g., "my division"), which of course cannot directly reciprocate the choice.

One can visualize an array of matrices similar to the one just discussed, with each matrix dealing with one particular activity. The following figure shows what this total scheme might look like:

In summary: The M.S.S. scheme indicates the relations (entries in cells) between individuals (x-axis and y-axis) for a number of activities (z-axis).

Among research questions generated by this are the following:

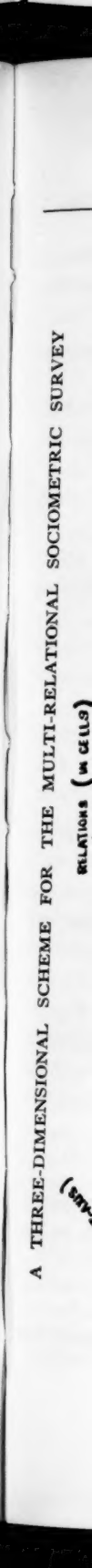
1. For any activity, what relational patterns characterize various organizational units? We shall construct some indices concerned with such patterns. These we shall call *intra-activity indices*. The relevant basic data are the entries in various cells of *any one matrix* defined by the x-y plane in the three-dimensional scheme.
2. What patterns are found in various organizational units as we trace any *one* relation from activity to activity? We shall construct some indices concerned with this. These we shall call *inter-activity indices*. The relevant basic data are the entries for *any one relation*, such as the prescribed, perceived, actual, desired, or rejected, as they appear in a horizontal array of cells along the z-axis, from one matrix to another.

IV

Intra-Activity Indices

Intra-activity indices are constructed on the basis of relation patterns in any one activity. They use as data the cell entries of any one matrix in the x-y plane.

[15] Actually the terms "chooser" and "chosen" are not entirely accurate, but will be used in lieu of neologisms, for no adequate terms seem to exist. The inaccuracy



A THREE-DIMENSIONAL SCHEME FOR THE MULTI-RELATIONAL SOCIOMETRIC SURVEY

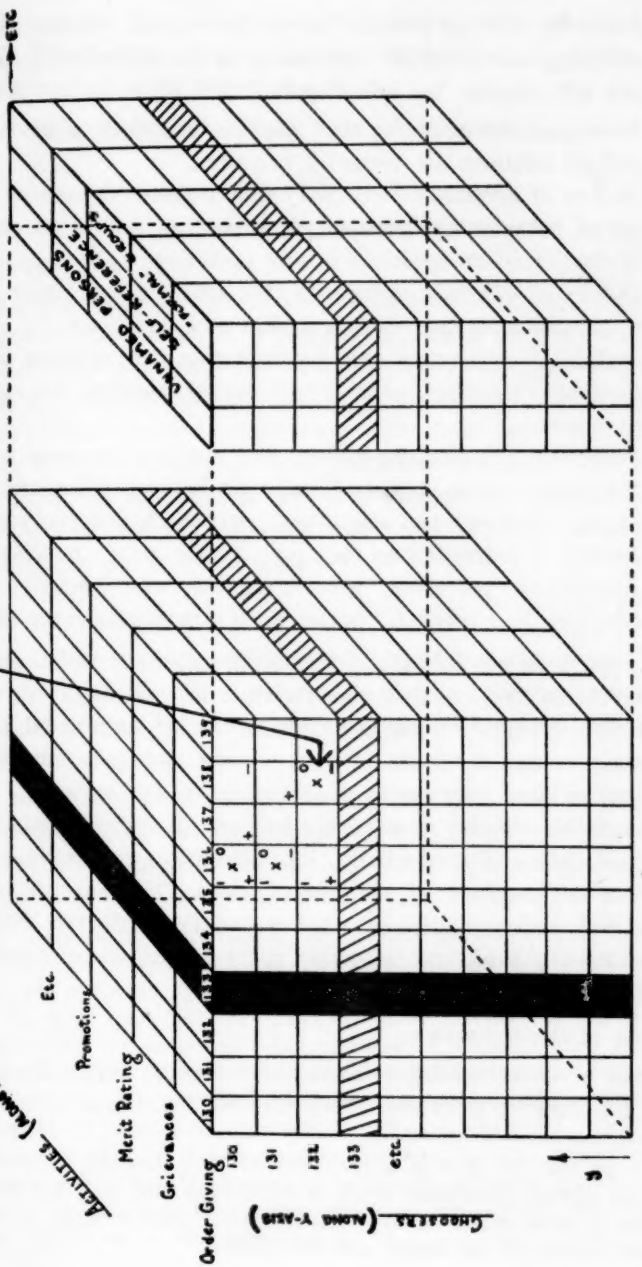


FIGURE III

Intra-activity indices provide information about various aspects of group functioning and about the functioning of the individual in the group. This section will consider the following indices:

1. *Indices of understanding* that measure the extent to which the prescribed relations are correctly perceived.
2. *Indices of normative conformity* that measure the extent to which actual behavior conforms to the prescribed and/or to perceptions of the prescribed.
3. *Indices of affective conformity* that measure the extent to which actual behavior conforms to desires and rejections.
4. *Indices of satisfaction and dissatisfaction* that measure the extent to which prescribed, perceived, or actual relations also are desired or rejected.
5. *Indices of affective atmosphere* that measure the state of balance that exists in an organizational unit between affectively positive choices (desired) and affectively negative choices (rejected).
6. *Indices of centralization* that measure the extent to which choices (prescribed, perceived, actual, desired, or rejected) are concentrated in a particular person or in a particular group of persons.

The hypothesis was formulated that some systematic variations in index magnitudes would be associated with variation in leadership style and with certain criteria of organizational effectiveness. As has been noted before, the two divisions, A and B, of the laboratory were chosen because there was some indication that they varied considerably in the leadership styles of their heads, with A being restrictively led, and B being permissively led. Further, perceptions of productivity, job satisfaction, and morale were obtained from the members of the two divisions. The example, contained in Section VII, indicates some expected co-variations between intra-activity indices, on the one hand, and leadership styles and criteria of organizational effectiveness, on the other.

1. *Indices of Understanding*

Indices of understanding measure the extent to which the prescribed relations are correctly perceived. They measure the degree to which people

stems from the fact that when X is prescribed for Y, Y does not necessarily do any choosing—the relevant prescription simply is thrust upon him. Nor is a perception of a prescribed or actual relation really a "choice" in the usual sense of the word. The only genuine choices are the desired and the rejected.

have an accurate idea about the formal organization in which they are involved. By definition, indices of understanding always have the prescribed and the perceived in the numerator.

The following is one possible index of understanding:

$$\Sigma' o \,/\, \Sigma' \qquad (1)^{16}$$

In words: "Of the prescribed relations (for a given activity such as order-giving), what percentage also is perceived?"

Each respondent is allowed to make a number of choices in answer to each question. Therefore, it is possible that there could exist perfect congruence between the perceived and the prescribed, yet complete understanding may not prevail since choices in addition to the correct one may be made. Thus, some individuals know with whom they are to interact, yet they may believe that they are also prescribed to interact with persons not so designated. An index can be devised to account for these multiple choices, which should be used to complement index (1). This complementary index is designated in the following manner:

$$\Sigma' o \,/\, \Sigma o \qquad (2)$$

Thus, there are two different indices of understanding. Index (1) answers the question, "what percentage of prescriptions is perceived correctly?" and Index (2) answers the question, "What percentage of the perceived is also prescribed?"

An analysis of understanding by organizational units or by individuals may demonstrate gaps in the comprehension of formal structure which may affect the functioning of these units.

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[16] In computations of all indices, the particular patterns, such as ′o, are counted whenever the relevant combination of relations appears, whether or not there are any other relations in the cell. Thus Σ′o is the sum of all cell entries which contain ′o, including ′ox, ′o+, ′ox+ ′o—, ′ox—, etc., as well as ′o alone. Indices, as used in the pilot investigation, are concerned with percentages of relations, rather than with percentages of individuals. Since multiple responses were permitted, this raises some questions of weighting. One individual with numerous choices exerts a relatively greater influence upon an index than an individual with a single choice. What implications this may have empirically would have to be determined by the construction of another set of measures in which the responses of individuals, regardless of number, would be weighted equally. For another possible solution of this problem, see Weschler, Tannenbaum, and Talbot, *op. cit.*, footnote 7, p. 91.

2. *Indices of Normative Conformity*

Indices of normative conformity measure the extent to which reported actual behavior conforms to the prescribed and/or to perceptions of the prescribed. These indices measure the degree to which people report that they do what they are supposed to do, or do what they *think* they are supposed to do. By definition, the actual always appears in the numerator.

As one measure of the degree of normative conformity (with the prescribed as the norm) one may use the proportion of all the prescribed relations which are actual relations as well. This is represented symbolically as:

$$\Sigma' x / \Sigma' \qquad (3)$$

A problem concerning multiple responses exists here similar to that encountered with the indices of understanding. This problem can be resolved by using the total number of actual as the base in determining the proportion of actual relations which are prescribed. Symbolically:

$$\Sigma' x / \Sigma x \qquad (4)$$

Thus, we have two measures of normative conformity with the prescribed as the norm. Index (3) answers the question, "what percentage of all prescribed relations is also actual?" Index (4) answers the question, "what percentage of all actual relations is also prescribed?"

Further, it is possible to measure normative conformity to relations *perceived* as being prescribed. The relevant indices would be the following:

$$\Sigma o x / \Sigma o \qquad (5)$$

$$\Sigma o x / \Sigma x \qquad (6)$$

Index (5) answers the question, "what percentage of all perceived relations is also actual?" Index (6) answers the question, "what percentage of all actual relations is also perceived?"

Still another set of measures of normative conformity is concerned with the extent to which an activity that is both prescribed and perceived is also reported as being acted upon:

$$\Sigma' o x / \Sigma' o \qquad (7)$$

Index (7) answers the question, "what percentage of all relations that are both prescribed and perceived (understood) is also actual?"

And similarly:

$$\Sigma' o x / \Sigma x \qquad (8)$$

Index (8) answers the question, "what percentage of all actual relations is also perceived and prescribed (understood)?"

We might consider some of the psychological meanings of these three sets of measures of normative conformity. The first set, indices (3) and (4), regards conformity as determined by the extent to which behavior corresponds to the organizational blueprint regardless of any other circumstances. In the second set, indices (5) and (6), conformity is concerned with the individual's own view of the organization in which he operates, whether or not this perceptual structuring corresponds to the blueprint. Finally, the third set, indices (7) and (8), is designed to judge conformity against the correctly perceived (or understood) relations only.

If, upon examination of indices (3) and (4), it is found that some persons show relatively little conformity to what is prescribed, then it should be ascertained whether these persons act in accordance with their perceptions of the prescribed—see indices (5) and (6). If they do, then better communication of the prescribed relations becomes the solution, providing it is agreed that organizational goals will be attained most effectively if prescriptions are followed. Another point to note is that when individuals are found to interact with persons neither prescribed for them nor perceived by them, this may be due to the lack of availability of the prescribed or perceived individuals or to hostilities with them.

3. *Indices of Affective Conformity*

Indices of affective conformity measure the extent to which reported actual behavior conforms to desires and rejections. They indicate the degree to which people's behavior is in accord with their preferences for interpersonal contact. By definition, the actual always appears in the numerator. These measures are somewhat similar in purpose to the indices of satisfaction which will be taken up in the next section.

The principal measure of affective conformity is concerned with the following question: "What percentage of all desired (or rejected) relations is also actual?" Symbolically:

$$\Sigma + x / \Sigma + \qquad (9a)$$

$$\Sigma - x / \Sigma - \qquad (9b)$$

4. *Indices of Satisfaction and Dissatisfaction*

Indices of satisfaction and dissatisfaction measure the extent to which prescribed, perceived, or actual relations are also desired or rejected. Thus, these indices measure relative satisfaction or dissatisfaction with formal organization and/or with the existing interactions. By definition, indices of

satisfaction always have the desired in the numerator; indices of dissatisfaction always have the rejected in the numerator.

One pair of relevant indices may be symbolized as follows:

$$\Sigma'+ / \Sigma' \qquad (10a)$$

$$\Sigma'- / \Sigma' \qquad (10b)$$

Indices (10a) and (10b) are concerned with the question, "what percentage of all prescribed relations is also desired (or rejected)?"[17]

A pair of indices focusing on the perceived instead of the prescribed may be represented symbolically as follows:

$$\Sigma o+ / \Sigma o \qquad (11a)$$

$$\Sigma o- / \Sigma o \qquad (11b)$$

Indices (11a) and (11b) answer the question, "what percentage of all perceived relations is also desired (or rejected)?"

Variants of these indices, which perhaps are more relevant to management, are the following:

$$\Sigma' o+ / \Sigma' o \qquad (12a)$$

$$\Sigma' o- / \Sigma' o \qquad (12b)$$

Indices (12a) and (12b) use the understood relations as the base. They answer the question, "what percentage of all relations that are perceived *and* prescribed (understood) is also desired (or rejected)?"

Still another type of satisfaction and dissatisfaction measure may focus on the actual relations:

$$\Sigma x+ / \Sigma x \qquad (13a)$$

$$\Sigma x- / \Sigma x \qquad (13b)$$

In a sense, indices (13a) and (13b) are the converse of the affective conformity measures (9a) and (9b). Indices (13a) and (13b) answer the question, "what percentage of all actual relations is also desired (or re-

[17] These indices measure satisfaction and dissatisfaction with reference to relations that are prescribed but *not necessarily* perceived. However, it may be of interest to find out to what extent prescribed relations are desired or rejected, regardless of the extent to which they are also perceived. For example, it may be that superiors designated to fulfill specific functions such as order-giving are well-liked in the roles which they are to fulfill according to the organizational blueprint, but few people are aware that these superiors are indeed assigned these roles. Clearly, the remedy for this kind of situation (which also would be indicated by some of the indices of understanding) would be more effective communication of the organizational prescriptions.

jected)?, while indices (9a) and (9b) answer the question, "what percentage of all desired (or rejected) relations is also actual?"

Indices of satisfaction and dissatisfaction may point to morale problems in various organizational units. When satisfaction indices between activities are compared, the comparisons may indicate those interactions that might be at the root of organizational difficulties.

5. *Indices of Affective Atmosphere*

An index of affective atmosphere measures the state of balance that exists in an organizational unit between affectively positive choices (desired) and affectively negative choices (rejected). If all affective choices are positive, the index figure will be 100; if the number of desired relations is the same as the number of rejected relations, the index figure will be 50; and if all affective choices are negative, the index figure will be 0. Thus, this index may provide some measure of the extent to which a pleasant emotional state characterizes the group.

Symbolically, the index may be stated as follows:

$$\Sigma(+) \,/\, \Sigma(+) + \Sigma(-)^{18} \qquad (14)$$

A variant of this index is concerned not merely with the balance between positive and negative choices, but also considers the extent to which such choices are accompanied by actual relations. It provides information on the ratio of desired-actual relations to the total number of actual relations with positive or negative affect. The following is a symbolic representation of this index:

$$\Sigma(+x) \,/\, \Sigma(+x) + \Sigma(-x) \qquad (15)$$

6. *Indices of Centralization*

An index of centralization measures the extent to which choices are concentrated in a particular person or in a particular group of persons.[19] Let us take an activity such as order-giving. For a hypothetical organizational unit, we note that there are 100 instances of prescription. By simple

[18] The plus sign in the denominator indicating addition of $\Sigma(+)$ and $\Sigma(-)$ should not be confused with our symbol for the desired relation which, of course, is also a "+" sign.

[19] Indices discussed so far have focused on relations existing within given organizational units. Here the emphasis shifts to choices received by specific persons. Thus it becomes important to count the total number of times *one particular* type of choice is received by a given person. For example, X may receive the following choice patterns from five people: 'ox, 'ox, '+ '—, 'x—. This would yield the following sum-

count, we find that 80 of these instances involve one person as the order-giver. Only 20 prescriptions are designated for other members of the group. It is clear that here the power inherent in order-giving is concentrated in that one person.

One such index of centralization may be calculated for each relation and the group of indices of centralization can be symbolized as follows:

$$\Sigma(')_x/\Sigma' \qquad (16a)$$
$$\Sigma(o)_x/\Sigma o \qquad (16b)$$
$$\Sigma(x)_x/\Sigma x \qquad (16c)$$
$$\Sigma(x)_x/\Sigma + \qquad (16d)$$
$$\Sigma(-)_x/\Sigma - \qquad (16e)$$

Each index (16a) through (16e) answers a question of this form: "What percentage of a given relation in a particular organizational unit involves a particular person or group of persons?"

A profile may be drawn, showing indices (16a) through (16e) for a specific superior; such a profile may summarize key aspects of that superior's leadership role. This will be further illustrated in Section VII.

V

Overlap Between Intra-Activity Indices

A consideration of the intra-activity indices suggests that a certain systematic overlap exists between various of the indices.[20]

For the sake of simplicity, we select three of the five relations: the actual, prescribed, and perceived. Representing each as a circle, we note the existence of certain overlapping areas. Each of these areas represents a particular relational pattern. In order to avoid repeating the entire symbolism, we can designate each area by a capital letter. Thus:

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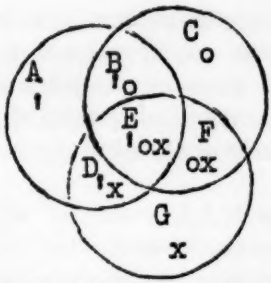
mary of choices when $\Sigma(')_X$, $\Sigma(o)_X$, $\Sigma(x)_X$, $\Sigma(+)_X$, and $\Sigma(-)_X$ are the respective totals of the prescribed, perceived, actual, desired, and rejected choices given to X:

$$\Sigma(')_X \ . \ . \ . \ 5$$
$$\Sigma(o)_X \ . \ . \ . \ 2$$
$$\Sigma(x)_X \ . \ . \ . \ 3$$
$$\Sigma(+)_X \ . \ . \ . \ 1$$
$$\Sigma(-)_X \ . \ . \ . \ 2$$

[20] We are indebted to Dr. Leon Festinger of the University of Minnesota for suggesting this matter.



Translating several of the indices into the capital-letter notation, we obtain the following:

Index (1): Σ'o/Σ' = B+E/A+B+D+E
Index (2): Σ'o/Σo = B+E/B+C+E+F
Index (3): Σ'x/Σ' = D+E/A+B+D+E
Index (4): Σ'x/Σx = D+E/D+E+F+G
Index (5): Σox/Σo = E+F/B+C+E+F
Index (6): Σox/Σx = E+F/D+E+F+G
Index (7): Σ'ox/Σ'o = E/B+E
Index (8): Σ'ox/Σx = E/D+E+F+G

Rewriting index (6) as (E/D+E+F+G) + (F/D+E+F+G), we note that in fact index (8), which is (E/D+E+F+G), is an important component of index (6). Specifically for Division A, index (8) = 63.64. Obtaining index (6), we find that it yields the figure 78.79. Thus, 15.15 points only (63.64 + 15.15 = 78.79) are accounted for by the component (F/D+E+F+G). It is clear that many of the indices, although of varying psychological meaning, systematically overlap one another.

VI

Inter-Activity Indices

In the previous section, we considered a number of measures that used as basic data the entries in the cells of any one matrix in the x-y plane. (See Figure III.) Next, we shall select specific relations, such as the prescribed, perceived, actual, desired, or rejected, and observe them as they appear when we focus on the z-axis, along which the various activities are arrayed.

1. *Indices of Pervasiveness*

An index of pervasiveness measures the extent to which any one relation connects a pair or pairs of specific individuals in a number of activities.

In other words, this index tells us how pervasive ties between two individuals are, as we examine several activities in which the persons may interact. It is possible to construct one index of pervasiveness for each relation. There exists an index of prescribed pervasiveness, perceived pervasiveness, actual pervasiveness, desired pervasiveness, and rejected pervasiveness.

Let us assume that an M.S.S. is designed which covers 20 activities—10 goal-directed and 10 nongoal-directed. The following might be one way of arranging the results showing the relations between individuals X and Y, in which Y is the chooser and X is the chosen. Each "f" represents the number of activities in which a particular relation exists for the individuals concerned.

	Goal-directed activities		Nongoal-directed activities		Total	
	$n_G = 10$		$n_{NG} = 10$		$n = 20$	
Y — X	f_G / n_G	(17a)	f_{NG} / n_{NG}	(17b)	f / n	(17c)

In a hypothetical case, $f_G = 7$, and $f_{NG} = 1$. If the relation used happens to be actual, this would mean that Y indicates that in 7 of the 10 goal-directed activities he is in actual contact with X, and that in 1 of the 10 nongoal-directed activities he is in contact with X. Stating these frequencies in percentages for each group of 10, we would say that the pervasiveness index for Y to X in the actual relation is 70 for the goal-directed activities and 10 for the nongoal-directed activities. This would suggest that Y sees himself as actually relating to X primarily in areas of behavior related to work, and considerably less in activities that are oriented toward off-job and personal need satisfactions. For *all* activities, the pervasiveness index would be 55, i.e., Y has actual relations with X in 11 of the 20 activities studied.[21]

2. *A Direct Approach to Inter-Activity Indices*

Instead of constructing measures such as the pervasiveness indices, it is possible to proceed simply by direct observation. We might look at the M.S.S. data, noting the combinations of activities in which a specific relation

[21] To justify the calculation of an index for all relations, some assumptions have to be made regarding the exhaustiveness or representativeness of the relations included in the study.

appears for any pair of individuals. For example, it might be that persons who are actual order-givers, frequently also are individuals with whom personal problems are discussed and from whom advice is solicited. Thus, order-giving, advice-seeking, and discussing personal problems may form a cluster, as defined by the appearance of the actual relation.

VII

An Example

Tables I, II, and III contain certain summaries of data, taken from the sociometric matrices, that were obtained in the pilot investigation at the laboratory. These summaries furnish the raw material for the calculation of the *intra*-activity indices. The data were not sufficient to permit calculation of any meaningful *inter*-activity indices.

Table I summarizes the relational patterns for one goal-directed activity, order-giving, and for one nongoal-directed activity, socializing after working hours. As is demonstrated by the formula for the total number of combinations of n different things (the sum of the number of combinations of n things taken 1, 2, . . . n, at a time): 2^n—1, there are 31 possible combinations (or relational patterns) for the goal-directed activity (number of relations, n = 5), and 7 different combinations for the nongoal-directed activity (n = 3). However, certain patterns are psychologically inconsistent because they contain both "most desired" (+) and "most rejected" (—). These patterns are marked by asterisks. Excluding these, the number of patterns drops to 23 for the goal-directed activity, and to 5 for the nongoal-directed activity. In fact, for order-giving, only 14 patterns actually were found in Division A, and 19 patterns in Division B. For socializing 4 patterns were found in each of the two divisions.

Table II summarizes relational *totals* for the divisions. The average number of choices per person for each relation is shown in parentheses. Table II may be derived directly from Table I. For example, the total of prescribed relations for Division A in order-giving is found by summing the frequencies of all patterns in which the prescribed (′) appears. Specifically, it is the total of patterns 1.1, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.1, 4.2, 4.3, 4.4, and 5.1.

Table III is an extract from the matrices, analogous to Table II, except for the fact that the summary of relational totals is shown for the two division heads only. A similar summary could be prepared for any other person in the organization.

TABLE I

A Summary of Relational Patterns[1]

			Frequency of Patterns for Order-Giving in Division A	Order-Giving in Division B	Socializing in Division A	Socializing in Division B
1. *One Relation*						
Pattern Code	1.1[2]	′	—	3	None	None[3]
	1.2	o	—	1	None	None
	1.3	x	3	9	21	15
	1.4	+	7	9	20	17
	1.5	—	10	9	21	17
2. *Two Relations*						
Pattern Code	2.1	′o	1	2	None	None
	2.2	′x	1	1	None	None
	2.3	′+	1	1	None	None
	2.4	′—	—	1	None	None
	2.5	xo	4	8	None	None
	2.6	+o	—	2	None	None
	2.7	o—	—	1	None	None
	2.8	+x	—	7	4	21
	2.9	x—	3	1	—	—
	*2.10	+—	—	—	—	—
3. *Three Relations*						
Pattern Code	3.1	′xo	9	6	None	None
	3.2	′+o	1	—	None	None
	3.3	′o—	1	—	None	None
	3.4	′+x	—	—	None	None
	3.5	′x—	—	—	None	None
	*3.6	′+—	—	—	None	None
	*3.7	+o—	—	—	None	None
	3.8	xo—	—	1	None	None
	3.9	+xo	1	10	None	None
	*3.10	+x—	—	—	—	—
4. *Four Relations*						
Pattern Code	4.1	′+xo	11	22	None	None
	4.2	′xo—	1	1	None	None
	*4.3	′+o—	—	—	None	None
	*4.4	′+x—	—	—	None	None
	*4.5	+xo—	—	—	None	None
5. *Five Relations*						
Pattern Code	*5.1	′+x—o	—	—	None	None

[1]All figures for choices within division.

[2]The patterns are grouped by number of relations in the pattern. The first numeral of each pattern code designates the number of relations in that group of patterns; the second numeral designates the particular pattern within the group. For example: 1.1, one relation, pattern one; or: 3.10, three relations, pattern ten.

[3]"None" indicates that no such pattern exists for the particular activity. The dash indicates that a pattern exists, but that in the pilot investigation no instances of this were found.

*Denotes inconsistent pattern, which includes both most desired and least desired (rejected).

TABLE II

A SUMMARY OF RELATIONAL TOTALS: ENTIRE DIVISION

	Order-Giving		*Socializing*	
	A	*B*	*A*	*B*
′	26 (0.93)[1]	37 (0.97)	None	None
o	29 (1.04)	54 (1.42)	None	None
x	33 (1.18)	66 (1.74)	25 (0.88)	36 (0.95)
+	21 (0.75)	51 (1.34)	24 (0.86)	38 (1.00)
—	15 (0.54)	14 (0.37)	21 (0.75)	17 (0.45)

[1]Figures in parentheses indicate "relations per individual." In Division A, 28 persons responded; in Division B, 38 persons responded. Thus, for example: 26/28 = 0.93. There are 0.93 prescriptions per person in Division A.

TABLE III

A SUMMARY OF RELATIONAL TOTALS: RECEIVED BY DIVISION HEADS ONLY

	Order-Giving		*Socializing*	
	DH:A	*DH:B*	*DH:A*	*DH:B*
′	7	7	None	None
o	9	13	None	None
x	12	16	4	3
+	4	13	2	2
—	11	3	6	4

Table IV is a summary of the intra-activity indices for the two divisions. By way of illustration, let us trace the process by which index (1), an index of understanding ($\Sigma'o/\Sigma'$) was calculated for Division A: To find the numerator, Table I is scanned for all patterns containing the combination ′o. These are patterns 2.1, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, and 5.1. The figure obtained is 24. To find the denominator it is necessary simply to examine Table II, the line marked ′. The figure is 26. Thus index (1) for Division A is 24/26 or 92.31.

A set of criteria against which the indices may be evaluated is provided by a series of responses regarding perceptions by the people in each division of morale, productivity, and job satisfaction. Table V summarizes some of the findings:

Thus it is indicated that Division B consistently exceeds Division A in high or very high ratings in job satisfaction, perceived productivity, and perceived morale. This finding becomes more meaningful when we consider the M.S.S. results. In the sociometric indices of satisfaction, indices (10a), (11a), (12a), and (13a), Division B ranks higher. On all of the indices

TABLE IV
INDEX SUMMARY

	Order-Giving				*Socializing*			
	Division A		*Division B*		*Division A*		*Division B*	
	Ratio	*%*	*Ratio*	*%*	*Ratio*	*%*	*Ratio*	*%*
Understanding								
(1) $\Sigma'o/\Sigma'$	24/26	92.31	31/37	83.78		—		
(2) $\Sigma'o/\Sigma o$	24/29	82.76	31/54	57.41		—		
Normative Conformity								
(3) $\Sigma'x/\Sigma'$	22/26	84.61	30/37	81.08		—		
(4) $\Sigma'x/\Sigma x$	22/33	66.67	30/66	45.45		—		
(5) $\Sigma ox/\Sigma o$	26/29	89.66	48/54	88.89		—		
(6) $\Sigma ox/\Sigma x$	26/33	78.79	48/66	72.73		—		
(7) $\Sigma'ox/\Sigma'o$	21/24	87.50	29/31	93.55		—		
(8) $\Sigma'ox/\Sigma x$	21/33	63.64	29/66	43.94		—		
Affective Conformity								
(9a) $\Sigma+x/\Sigma+$	12/21	57.14	39/51	76.47	4/24	16.67	21/38	55.26
(9b) $\Sigma-x/\Sigma-$	4/15	26.67	3/14	21.43	0/21	0	0/17	0
Satisfaction and Dissatisfaction[1]								
(10a) $\Sigma'+/\Sigma'$	13/26	50.00	23/37	62.16		—		
D (10b) $\Sigma'-/\Sigma'$	2/26	7.69	2/37	5.41		—		
(11a) $\Sigma o+/\Sigma o$	13/29	44.83	34/54	62.96		—		
D (11b) $\Sigma o-/\Sigma o$	2/29	6.89	3/54	5.56		—		
(12a) $\Sigma'o+/\Sigma'o$	12/24	50.00	22/31	70.98		—		
D (12b) $\Sigma'o-/\Sigma'o$	2/24	8.33	1/31	3.23		—		
(13a) $\Sigma x+/\Sigma x$	12/33	36.36	39/66	59.09	4/25	16.00	21/36	58.33
D (13b) $\Sigma x-/\Sigma x$	4/33	12.12	3/66	4.55	0/25	0	0/36	0
(14) $\Sigma+/\Sigma(+) + \Sigma(-)$	21/36	58.33	51/65	78.46	24/45	53.33	38/55	69.09
(15) $\Sigma(+x)/\Sigma(+x) + \Sigma(-x)$	12/16	75.00	39/42	92.86	4/4	100.00	21/21	100.00
(16a) $\Sigma(')_x/\Sigma'$	7/26	26.92	7/37	18.92		—		
(16b) $\Sigma(o)_x/\Sigma o$	9/29	31.03	13/54	24.07		—		
(16c) $\Sigma(x)_x/\Sigma o$	12/33	36.36	16/66	24.24	4/25	16.00	3/36	8.33
(16d) $\Sigma(+)_x/\Sigma+$	4/21	19.05	13/51	25.49	2/24	8.33	2/38	7.14
(16e) $\Sigma(-)_x/\Sigma-$	11/15	73.33	3/14	21.43	6/21	28.57	4/17	23.53

[1]Indices of *dis*satisfaction, for which low values indicate satisfaction, are marked with a D.

of dissatisfaction, (10b), (11b), (12b), and (13b), Division A ranks higher. Thus, it would seem that at least as far as order-giving is concerned, the various measures of satisfaction and dissatisfaction vary concomitantly with the measures of job satisfaction, perceived productivity, and perceived morale. The indices of affective conformity, (9a) and (9b), and of affective

TABLE V

A SUMMARY OF PERCEPTUAL RATINGS OF JOB SATISFACTION, MORALE, AND PRODUCTIVITY

	Job satisfaction of each person in division		Productivity of division		Morale of division	
	% rating high or very high	% rating low or very low	% rating high or very high	% rating low or very low	% rating high or very high	% rating low or very low
Division A	39.3	14.3	28.6	18.6	21.4	53.6
Division B	63.2	7.9	55.2	7.9	81.6	2.6

[1]Adapted from I. R. Weschler, M. Kahane and R. Tannenbaum, "Job Satisfaction, Productivity and Morale: A Case Study," *Occupational Psychology,* XXVI (January, 1952), p. 5.

atmosphere, (14) and (15), show a similar relationship. Here, too, the indices for Division B suggest the more harmonious social situation.

On the other hand, in understanding of prescription, higher indices (1) and (2) are found in Division A. Similarly, for five of the six indices of normative conformity, (3), (4), (5), (6), and (8), measures for Division A are somewhat higher than those for Division B, although the differences generally are slight. Only in index (7), which measures conformity to the understood ($\Sigma'ox/\Sigma'o$) does the index figure for Division B exceed that of Division A.

These findings indicate greater understanding of prescription and a somewhat higher degree of conformity to prescription in Division A than in Division B. But Division B ranks higher than Division A in satisfaction with interpersonal relations, in conformity of behavior (actual) to the desired, and in affective atmosphere. These results make sense in light of the following: (1) Division B provides higher ratings in job satisfaction, perceived morale, and perceived productivity. (2) As indicated by a broad *a priori* analysis of the two divisions, Division A appears to have certain attributes associated with restrictive leadership, while Division B has attributes associated with permissive leadership.

faction, (5) indices of acective atmosphere, and (6) indices of centraliza-

Further evidence is furnished by the indices of centralization. The prescribed, perceived, and actual relations are more centralized in the head of Division A than in the head of Division B—see (16a), (16b), (16c). On the other hand, the head of Division B receives a greater proportion of desired choices than the head of Division A—see (16d), while conversely, and significantly, a much greater proportion of the rejected relations is

concentrated in the head of Division A, who heads the division characterized by restrictive leadership.

In examining indices for affective conformity, satisfaction, and affective atmosphere—see (9a), (13a), and (14)—for the activity of socializing after working hours, we observe that again the more harmonious social situation exists in the permissively led Division B. For indices (9b), conformity of actual to rejected, and (13b), dissatisfaction with actual relations, both divisions reveal zero scores. This is not hard to understand in view of the fact that usually, although not necessarily, people will not seek voluntary social intercourse with those they reject. An exception to this may be provided by instances in which socializing is oriented toward an end, such as the influencing of a superior regarding a promotion, even though, in fact, that superior may be rejected. Analogously, the scores for both divisions on index (15), which measures the extent to which socializing interactions with positive affect predominate over those with negative affect, are 100. Again, this is plausible because social contacts outside the job setting will be primarily with those people who are desired as social companions, rather than with those who are rejected in that role.

So far, order-giving has been the only goal-directed activity that we have considered, but we may inquire how the several indices compare when calculated for a number of other activities. Some relevant data are shown in Table VI:

TABLE VI

A Comparison of Selected Indices for Several Goal-Directed Activities in Divisions A and B

	Understanding Index (1) $\Sigma'o/\Sigma'$		Normative Conformity Index (3) $\Sigma'x/\Sigma'$		Satisfaction Index (10a) $\Sigma'-/\Sigma'$	
	Div. A	Div. B	Div. A	Div. B	Div. A	Div. B
Order-Giving	92	84	85	81	50	62
Efficiency Rating	96	76	29	68	54	61
Grievance Handling	86	61	74	58	36	45
Determination of Promotions	59	63	45	50	22	45
Pointing Out Mistakes	79	74	71	80	43	55

For all activities but determination of promotions, understanding of prescription, as measured by index (1), is greater in the restrictively led Division A. Conversely, for all relations, satisfaction, as measured by index (10a), is greater in the permissively led Division B. However, in efficiency

rating, determination of promotions, and pointing out mistakes, normative conformity in Division B exceeds corresponding measurements for Division A. At first glance this is puzzling, because, as indeed is the case for order-giving and grievance handling, we would have expected higher conformity in the restrictively led division. This lack of conformity can be explained, however: indices of centralization (not shown here) indicate that the head of Division A assumes much more responsibility for efficiency rating, promoting, and pointing out mistakes than is prescribed for him. Thus, the index of conformity is lowered, because the division head himself has gone beyond the limits set for him by organizational fiat.

Looking at Table VI from a different standpoint, it is apparent that some activities more often rank high on certain indices than others. For example, in understanding and satisfaction, order-giving and efficiency rating typically exceed the other indices in magnitude. Thus, the interpersonal networks for order-giving and efficiency rating are understood more clearly, and accepted somewhat better, than corresponding networks for grievance handling, for the determination of promotions, and for pointing out of mistakes. Normative conformity is highest for order-giving.

In most instances, indices of understanding for the various relations have the greatest magnitudes. They are followed by indices of normative conformity and by indices of satisfaction in that order.

In the pilot investigation, only eleven activities were studied. Thus, the data obtained did not lend themselves to an adequate construction of inter-activity indices. A hypothetical example, demonstrating the use of these indices, was given in the section on inter-activity indices, pp. 23-B-24.

VIII

Summary

The Multi-Relational Sociometric Survey is an extension of sociometric methodology to a variety of interpersonal activities and relations. Activities may be clearly directed to the attainment of organizational goals (goal-directed, e.g., order-giving) or they may not be so directed (nongoal-directed, e.g., socializing after working hours). Five relations are distinguished: (1) the prescribed, which resembles the organizational blueprint, (2) the perceived, which corresponds to the extent to which persons in the organization are aware of the blueprint, (3) the actual, which indicates the reported interactions among the members of the organization, (4) the desired, which indicates preferences regarding interactions, and (5)

the rejected, which indicates aversions to interactions. For goal-directed activities all five of these relations are relevant; for nongoal-directed activities, only the last three are relevant.

A pilot investigation was conducted in a Southern California naval research and development laboratory. Sixty-six subjects, from two contrasting divisions, were studied. The data were organized in the form of a series of matrices, one for each activity. Information on the specific relations was entered in the cells of each matrix. Using the cell entries of any one matrix as raw data, a series of *intra-activity* indices was constructed: (1) indices of understanding, (2) indices of normative conformity, (3) indices of affective conformity, (4) indices of satisfaction and dissatisfaction, (5) indices of affective atmosphere, and (6) indices of centralization. Systematic overlap among intra-activity indices was discussed. Using entries dealing with a given relation as it appears in various activities as raw data, some *inter-activity* indices were also constructed.

An article (see pp. 25-34) using the data obtained in the pilot investigation suggests that there are some significant relationships between intra-activity index results, on the one hand, and perceived morale, perceived productivity, job satisfaction, and leadership style, on the other. For example, indices of satisfaction were higher in the more permissively led of the two divisions, which also had higher ratings from its members on morale, productivity, and job satisfaction. Understanding of the organizational blueprint was shown to be higher in the more restrictively led division.

The M.S.S. technique requires considerable further theoretical examination and empirical testing. Indices other than those proposed here may ultimately prove more useful, and various refinements or simplifications are no doubt possible. However, it is suggested that by making the sociometric method multi-relational through the systematic examination of several activities and relations, desirable dimensions of depth and realism are added to the sociometric study of social structure.

TASK AND ACCUMULATION OF EXPERIENCE AS FACTORS IN THE INTERACTION OF SMALL GROUPS[1]

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I

A recent paper published in this journal by Heinicke and Bales[2] considered developmental trends in the social structure of small groups when the same members continue interacting together. The present paper reports results on a contrasting type of case: one where the subjects are rotated through a series of groups so that the development of social structure is minimized but the task is kept the same. The evidence suggests that there are developmental trends in the interaction which can be attributed to the type of task and the accumulation of similar experiences by the members. However, the trends are different from those which appear when social structure is allowed to form.

II

The data presented by Heinicke and Bales were observations of groups studied at Northwestern University and at Harvard University, using Bales' method of observation.[3] The categories of observation are shown in Table 1. Each small group participated in four (Harvard) or six (Northwestern) sessions in which the conditions of participation and task were maintained as constant as possible in the laboratory situation. The groups may be described generally as discussion groups on human relations case material; the apparent major difference between the two samples was that the Harvard groups received more "facts" concerning the cases they discussed. Comparison of the Harvard and Northwestern data indicated that while scoring conventions, group size, and the differences in facts avail-

[1] This research was supported in part by the United States Air Force under contract number # AF 33 (038)-12782 monitored by the Human Resources Research Institute, Maxwell Air Force Base, Alabama. Permission is granted for reproduction, translation, publication and disposal in whole or in part by or for the United States Government.

[2] Heinicke, Christoph and Robert F. Bales, "Developmental trends in the structure of small groups," SOCIOMETRY, Vol. XVI, no. 1, Feb. 1953.

[3] Bales, Robert F., *Interaction Process Analysis*, Addison-Wesley Press, Cambridge, Mass., 1950.

TABLE I

CATEGORIES USED IN THE OBSERVATION OF INTERACTION

1	SHOWS SOLIDARITY, raises other's status, gives help, reward:
2	SHOWS TENSION RELEASE, jokes, laughs, shows satisfaction:
3	AGREES, shows passive acceptance, understands, concurs, complies:
4	GIVES SUGGESTION, direction, implying autonomy for other:
5	GIVES OPINION, evaluation, analysis, expresses feeling, wish:
6	GIVES ORIENTATION, information, repeats, clarifies, confirms:
7	ASKS FOR ORIENTATION, information, repetition, confirmation:
8	ASKS FOR OPINION, evaluation, analysis, expression of feeling:
9	ASKS FOR SUGGESTION, direction, possible ways of action:
10	DISAGREES, shows passive rejection, formality, withholds help:
11	SHOWS TENSION, asks for help, withdraws "Out of Field":
12	SHOWS ANTAGONISM, deflates other's status, defends or asserts self.

able may have caused absolute numerical differences between samples, the observed time trends in the interaction patterns of the samples over four sessions appeared to be very much the same. On this basis it was possible to pool the data of the two samples to examine the interaction trends from session to session. The pooled data are presented as Table II.

The most apparent trends outlined were as follows:[4]

> There is a trend toward decreasing rates in the task-oriented categories (giving orientation, giving opinion, and giving suggestion) and a concomitant rise in the social-emotional categories. Negative reactions are low in the first session, show a sharp rise in the second session, and thereafter decrease again. Positive reactions as a whole show a minor rise through the first three sessions, and then a larger rise in the fourth. There are two kinds of trends within the area of positive reactions, however. Overt showing of agreement shows a steady and significant downward trend, which is counteracted by a sharply rising trend of showing solidarity and tension release (largely joking and laughing). In other words there is a marked shift from the more neutral and tentative task-oriented "agreement" to the more affectively-charged types of Positive Reactions.
>
> Described more globally, and with a little more interpretation, it appears that on the average these groups started in session 1 with a

[4] Heinicke and Bales, *op. cit.*, p. 16.

TABLE II

INTERACTION TRENDS OVER TIME FOR NORTHWESTERN AND HARVARD GROUPS COMBINED

Categories	Percentage Rates* by Sessions				All Sessions
	1	2	3	4	
1 - 2	8.0	9.8	12.1	21.0	12.7
3	18.2	16.8	14.9	12.7	15.7
4	10.1	8.9	10.0	6.9	9.0
5	28.0	26.8	26.5	22.1	25.9
6	15.6	13.4	14.1	13.7	14.2
7 - 8 - 9	4.3	3.9	3.9	3.7	4.0
10	9.2	13.9	10.5	10.1	10.9
11	0.7	1.1	0.8	0.8	0.9
12	0.1	0.6	0.2	0.6	0.4
Total	94.2	95.2	93.0	91.6	93.7
A	26.9	27.1	27.8	33.9	28.9
B	54.6	49.7	51.3	43.4	49.8
C	4.3	3.9	3.9	3.7	4.0
D	10.5	16.0	11.8	12.0	12.6
Total	96.3	96.7	94.8	93.0	95.3
A - D	15.0	6.8	14.5	19.8	14.0

* This table is adapted from Table 2, SOCIOMETRY, Vol. XVI, no. 1, p. 17. Percentages do not total to 100% because of use of arc sine transformation and omission of one of the Northwestern categories. For complete details see the original table.

heavier emphasis on task-oriented types of interaction, with inhibition of the more affective types of reaction and with low rates of overt negative reactions. In session 2, however, overt negative reactions show a sharp rise, task-oriented activities begin to decline, and positive reactions, while maintaining their level, show a shift to greater affect. It appears that session 2 is, on the average, the session of greatest conflict. In sessions 3 and 4 the shift toward greater affect and less emphasis on task-oriented activities continues, but the negative reactions drop and the positive reactions rise. It appears that the groups have gone through some sort of "crisis."

The design of the experiment involved in the observation of these groups was such that the group members remained the same for the sequence of four sessions and the tasks were made as similar as possible and rotated in a Latin square design. Presumably, thus, changes occurring by session sequence could be attributed to the development or crystallization of group structure over time.

III

A limited opportunity for observing changes by session in a sequence of sessions in which the group structure could not be construed as developing over time (over the sequence of sessions) occurred as a by-product of research carried out with the United States Air Force. In this case the groups were three man groups rather than five or six man groups (as in the Harvard-Northwestern study), so that it was felt necessary to examine additional data from Bales' observations to determine whether systematic differences occurred in the profiles and trends of *groups of different sizes,* merely as a function of size of group. For this purpose four sets of data of three man groups, all run in a form exactly parallel to the larger Harvard groups, were taken from Bales' files for comparison with the larger sample already reported. The data from these Harvard three man groups are presented below as Table III and should be examined

TABLE III

INTERACTION TRENDS OVER TIME FOR HARVARD THREE MAN GROUPS

Categories	Percentage Rates by Session				All Sessions
	1	2	3	4	
1	1.3	3.3	1.9	5.3	2.9
2	2.6	4.1	3.2	7.0	4.2
3	22.4	23.3	17.5	19.7	20.8
4	6.9	5.4	4.6	5.6	5.7
5	31.0	33.5	33.8	30.8	32.3
6	16.3	16.3	13.6	16.8	15.8
7	3.9	2.8	3.5	2.9	3.3
8	2.5	2.3	2.2	1.9	2.2
9	1.4	1.1	0.9	0.8	1.1
10	7.4	5.7	13.5	6.6	8.2
11	3.0	2.3	2.9	2.2	2.6
12	1.3	0.1	2.3	0.2	1.0
Total	100.0	100.2	99.9	99.8	100.1
A	26.3	30.7	22.6	32.0	27.9
B	54.2	55.2	52.0	53.2	53.8
C	7.8	6.2	6.6	5.6	6.6
D	11.7	8.1	18.7	9.0	11.8
Total	100.0	100.2	99.9	99.8	100.1
A - D	14.6	22.6	3.9	23.0	16.1

for replication and systematic differences with the data of Table II. Comparisons, however, should be interpreted very tentatively since the total number of sessions of Harvard three man groups is small (16), and the number of actual groups is only four.

Looking first at the total profiles averaging all groups and sessions together (last columns of the tables), the following comparisons and tentative interpretations may be made: Categories 1 and 2 (showing solidarity and tension release) are lower in the three man groups than in the larger groups, while category 3 (overt agreement) is considerably higher. In other words the positive reactions seem to be more neutral and constricted in the three man groups. Category 4 (giving suggestion) is lower, category 5 (giving opinion) is higher, suggesting less decisive task movement in the three man groups, and category 6 (giving orientation) is about the same. Categories 7, 8, and 9 (asking questions) are about the same or slightly higher. Category 10 (disagreement) is somewhat lower, and categories 11 and 12 (showing tension and showing antagonism) are somewhat higher. The general impression given by the pattern of rates is one of greater constriction of positive affect, less decisive task movement and greater social-emotional difficulty in the three man groups.

The trend toward decreasing rates in the task-oriented categories (4, 5, and 6) found in the larger groups is not marked in the three man sample, and the pronounced drop in the last session of the sequence does not prevail. This fits reasonably with the interpretation just given of unsatisfactory task movement. The trend in negative reactions in the three man groups differs from that reported for the larger groups in that the greatest amount of negative reactions occurs in the third session, and the second session, previously the highest, is now the lowest. The interpretation of a "crisis," however, is still appropriate. It simply occurs later. The trend of positive reactions of the three man groups is consistent with that displayed by the larger groups, although the rates are more irregular. As in the larger groups, the overt showing of agreement follows a downward trend, but this is more than counteracted by a rising trend of showing solidarity and tension release. In both larger and smaller groups the positive reactions become more overtly emotional and increase in total quantity after the "crisis." To examine the causes for the inconsistencies of trends and norms for the compared groups we went back to an examination of the single sessions themselves. One thing became immediately apparent, and that was that the variation of performance

between the different three man groups was very marked. This might have been suggested directly as a hypothesis worth testing in view of the reputation of three man groups for "instability." The present small sample of three man groups should be considered merely as suggestive in this comparison of the effects of group size on the profiles and trends of interaction. With proper caution, however, it is suggested that three man groups as compared to five and six man groups will tend to show considerable variation, and that they will show evidence of greater emotional difficulty in arriving at a stable and satisfactory social organization. However, like the larger groups they show evidence of a "crisis and recovery" pattern which may be interpreted as a developmental characteristic connected with the crystallization of a structure of accepted social roles of the members.

The data to be presented now bear on this hypothesis since the experimental conditions were arranged so that there was minimal opportunity for a social structure to form from session to session. Under these conditions we should expect that the developmental trends attributed to the crystallization of social structure would not appear.

The Air Force Data

The Air Force data collected consisted of 168 sessions of three man groups. The design of the experiment was such that 126 subjects participated. The subjects were male enlisted personnel assigned to the research project on temporary duty. The subjects were initially given an orientation period of more than half an hour. In this period an attempt was made to attract their full cooperation; the full details of the time schedule were given the subjects, their special and ordinary problems were taken up for consideration and immediate action, and they were extended a full guarantee of protection in their careers in the Air Force. The purpose of the testing was represented as being the observation of how small groups work together, and the medium was role playing. They were told that the only part on which the researchers would focus was the role playing, and the idea of role playing was explained to them in detail with copious examples. The observation rooms were explained and the subjects were told that they would be permitted to see the "works" from behind the one way mirror after they had completed their series of sessions. The problem of timing was emphasized as one of not delaying others and of not having greater experience than others. Further, since acquaintance with others might be a factor, the subjects (recruited from a large number of organiza-

tions in order to minimize the possibility of acquaintance) were requested not to converse until after they had participated together. Since each person would eventually participate with each other person, all persons would be acquainted before the two days were over. The differences in grade were controlled by assignment of subjects to equivalent batches of nine. The men in each batch of nine were combined and recombined into twelve different three man groups in such a way that each subject participated in four of the sessions and participated with each other subject only one time. Each batch of nine participated in the testing program for two days, and at each stage subjects had the same amount of experience in the testing program (with minor exception).

Each session was 48 minutes long and was repeated in identical form (within the laboratory limitations). The sessions were designed to gather data to be classed under two headings, *Actual Situations* and *Role Playing*. The sequence in each session was:

Actual Behavior—get acquainted—six minutes
Actual Behavior—planning a role playing session—six minutes
Role Playing Behavior—role playing—twelve minutes
Actual Behavior—planning a role playing session—six minutes
Role Playing Behavior—role playing—twelve minutes
Actual Behavior—relax—six minutes

The data were collected by these time periods, and the classes of behavior were combined for each session so that each class, *Actual* and *Role Playing*, could be considered as 168 matched observations of sessions.

Characteristics of the Nine and Three Man Groups

The formal instructions given the men concerning participation in the experiment were gently but *strictly* enforced. Enforcement of the request restricting conversation between subjects in the groups of nine was facilitated by the fact that the testing program was full, and ordinarily subjects had one task or another at hand to occupy them. Similarly, lunches for the participants were staggered, so that this was not a social event. The batches of nine, thus, were prevented, so far as possible, from developing a meaningful differentiated structure until after the referent persons had participated and the relevant observations were made. However, it should be noted that in an attitudinal sense there was some contagion possible and an *esprit de corps* in a generalized sense concerning the

testing probably occurred. While conversation was restricted, it could not be completely stopped, so the subjects may be said to have been acquainted prior to the sessions at least to the degree of having been in proximity in the orientation room and possibly having heard each other ask questions or answer questions, and further, possibly having had a brief "violation-of-rules" conversation. This cumulation of common experience may be viewed as pre-structuring the three man groups to some limited extent.

A further limited possibility of communication was inherent in the design. It is best illustrated by an example. Suppose that in the first session persons 1, 2, and 3 participate and person 1 tells a joke. In the second session in which each of these three participates, each participates with two other persons (the remaining six), and if each of the original three repeats the joke it will be socialized to the entire batch of nine. Any further repetition, therefore, in the third session would have to be in the presence of persons who already have the information through prior participation. Thus, the common experience of the three members of three man groups could be recognized by them as common after the second session. However, this sequential type of communication cumulation was probably extremely limited in occurrence.

The restriction of common experience, except for experience which may be called "test experience" or parallel experience in testing, allows us to consider the three man groups as *occurring in session sequence without allowing the growth of a differentiated internal structure of the particular three man group.* The three man group with the same participants *does not exist over the sequence of sessions,* and the common experience of the subjects in terms of acquaintance (which might imply pre-structuring) is minimized. However, we have observations in terms of session sequence, the sample of participants at any point of the sequence is identical, and the task definition and participation conditions are as well controlled as is possible under laboratory conditions. We may now compare the data, presented as Table IV (Actual) and Table V (Role Playing), with the data presented in Tables II and III.

Air Force Three Man Groups, Actual Behavior (Table IV)

In terms of the pooled profile averaging all groups and all sessions, (last column of the tables) the following comparisons may be made: Categories 1 and 2 (showing solidarity and tension release) are lower than in the Northwestern-Harvard sample, but not dissimilar to the Harvard

TABLE IV

INTERACTION TRENDS OVER TIME OF THE AIR FORCE THREE MAN GROUPS, ACTUAL BEHAVIOR

Categories	Percentage Rates by Session				All Sessions (168)
	1	2	3	4	
1	2.56	2.40	1.95	2.42	2.33
2	5.67	6.57	5.88	5.75	5.95
3	10.59	8.85	9.50	8.13	9.30
4	6.23	6.68	5.02	5.37	5.82
5	26.38	26.50	28.94	27.28	27.29
6	33.98	32.10	33.80	35.20	33.79
7	6.58	6.71	6.72	7.21	6.80
8	2.11	1.82	2.02	1.71	1.92
9	0.64	0.93	0.72	0.70	0.74
10	0.93	0.78	0.97	0.91	0.90
11	4.24	6.65	4.33	5.20	5.07
12	0.09	0.03	0.16	0.11	0.10
Total	100.00	100.02	100.01	99.99	100.01
A	18.82	17.82	17.33	16.30	17.58
B	66.59	65.28	67.76	67.85	66.90
C	9.33	9.46	9.46	9.62	9.46
D	5.26	7.46	5.46	6.22	6.07
A - D	13.56	10.36	11.87	10.08	11.51

three man group sample. Category 3 (overt agreement) is lower than for the Northwestern-Harvard sample, which is itself considerably lower than the Harvard three man group sample. Category 4 (giving suggestions) is similar to the Harvard three man group sample, but lower than the Northwestern-Harvard sample. Category 5 (giving opinion) is about the same as the Northwestern-Harvard sample, but lower than the Harvard sample. Category 6 (giving orientation) is very much higher than both the Bales samples. Similarly, category 7, (asking for orientation) is higher than both the Bales samples. The other questions are about the same. Category 10 (disagreement) is extremely low in comparison to the two other samples. Category 11 (showing tension) is considerably higher, and category 12 (shows antagonism) is somewhat lower.

Described generally and with a relatively loose interpretation we may characterize the differences as follows: The Air Force three man groups are by comparison well described as task emphasizing high tension groups

with constriction of both positive and negative reactions, even neutral agreements and disagreements. This is consistent with the research design which placed an emphasis on the time element and further required task completion. That is, the session members had to complete the planning of the role playing session within the allotted time period (six minutes). A second factor which may be construed as making for tension was the apparent attempt to avoid repetition of role playing situations.

The first task presented to the three man groups was to get acquainted, and this probably served to keep category 1 (showing solidarity) from being depressed. At the same time, it may have contributed to the amount of category 7 and category 6 (asking for and giving orientation). Concomitantly, the lower amount of category 3 (overt agreement) may be taken as an indication of "over control" or resistance to making a stand. It would appear that a large proportion of the category 3 responses were acknowledgements rather than agreements. Similarly, the very low incidence of category 10 (disagreement) may be taken as resistance to taking a definite position. The amount of category 2 (tension release) is not high, and this is an indication that the tension displayed was not being dissipated.

Now to compare the trends. The trend displayed in the Northwestern-Harvard five and six man sample of a decrease in task-oriented categories is not found in the Air Force three man groups. If anything, there is a slight reverse trend. Conversely, the socio-emotional categories show no tendency to increase. Loosely, this may be interpreted as an indication that in the groups allowed to develop structure over time (Northwestern-Harvard) a base of information and attitude is built up and known to be held in common by the members. This "common culture base" is cumulative and does not require as much interaction for its maintenance and further building as it required in the earlier stages. Having some estimate of their own positions in the group, the developing group's members may feel a greater "security" to respond at the socio-emotional level. In the groups which do not continue over time (Air Force sample), however, much of the interaction in *each* session is devoted to a set of relationships which is the beginning of a group structure. This has to be done anew in each session. The great amount of activity in getting and giving information in these groups is consistent with this interpretation.

The trend of rise in the socio-emotional area in the Northwestern-Harvard sample and the Harvard three man sample is largely attributed

to the rise in categories 1 and 2 (showing solidarity and tension release). *This important and significant trend is not present in the Air Force data.* The trend towards a decrease in category 3 (overt agreement) does appear in the Air Force data but it is not marked. The amount of category 10 (disagreement) and category 12 (antagonism) is consistently low in the Air Force sample and neither shows any indication of a "crisis" in the sense of a period of overt conflict. However, the trend in category 11 (showing tension) is similar to the Northwestern-Harvard data in that the second session is the highest in this category. Is it reasonable to think of this as a "crisis session," even though these particular people have never worked with each other before? If so, it can hardly be a crisis in their particular status relationships *vis-à-vis* each other, but must have something to do with the relation of all groups to the overlying test situation or experimenter. Perhaps it is preoccupation with the question left unanswered after the first trial: "How are we doing?" This preoccupation appears to diminish for the Air Force groups after the second session. There is another rise in category 11 in the last session, and this is possibly related to the prospective termination of the extended testing. This rise in category 11 is not accompanied by a rise in tension release as is the one in the second session, and might be interpreted as fatigue and impatience in the test procedure. In terms of *amount of total interaction* in the ordered sessions, while the data is not presented here, it should be noted that the first and third sessions have the highest rate of activity, and the second and fourth sessions, the two with the highest amount of tension displayed, have lower rates of activity.

Air Force Three Man Groups, Role Playing Behavior (Table V)

Considerable difference was expected between the profile of the Role Playing Behavior and other available profiles. The major task of the role playing periods was to maintain the role playing itself. What the role playing would be and the assignment of roles was already established before the role playing began in the part of the session designated as "planning role playing." In practical terms, there were no restrictions on the role playing other than those which inhered in the structure of the laboratory situation, but topic and medium was explicitly indicated as unrestricted.

In terms of the total profile averaging all groups and all sessions (last column of the tables) the following pattern of differences appears: Categories 1 and 2 (showing solidarity and tension release) are lower than the Actual

TABLE V

INTERACTION TRENDS OVER TIME OF THE AIR FORCE THREE MAN GROUPS, ROLE PLAYING BEHAVIOR

Categories	Percentage Rates by Session				All Sessions (168)
	1	2	3	4	
1	1.04	0.63	0.69	0.48	0.71
2	2.01	2.99	2.11	1.80	2.22
3	10.78	11.82	9.81	10.63	10.75
4	3.33	2.57	3.05	2.37	2.82
5	39.36	41.31	41.57	43.26	41.40
6	28.56	28.37	30.07	28.75	28.95
7	4.08	3.78	5.06	4.73	4.42
8	5.64	4.92	4.94	4.98	5.12
9	0.27	0.23	0.14	0.17	0.20
10	1.41	1.08	1.44	1.33	1.32
11	3.09	1.67	0.78	0.83	1.57
12	0.43	0.64	0.36	0.67	0.53
Total	100.00	100.01	100.02	100.00	100.01
A	13.83	15.44	12.61	12.91	13.68
B	71.25	72.25	74.69	74.38	73.17
C	9.99	8.93	10.14	9.88	9.74
D	4.93	3.39	2.58	2.83	3.42
A - C	8.90	12.05	10.03	10.08	10.26

Behavior or the Bales samples. Category 3 (overt agreement) is somewhat higher than the Actual Behavior, but is still considerably lower than both the Bales samples. Category 4 (giving suggestion) is considerably lower than Actual Behavior and the Bales samples; Category 5 (giving opinion) is much higher than all samples; Category 6 is much higher than both Bales samples, but is somewhat lower than Actual Behavior. Category 8 (asking for opinion) is higher than all samples. The other question categories are not markedly different from the Bales samples, but Category 7 (asking orientation) is lower than the Actual Behavior. Category 10 (disagreement) continues to be considerably below the Bales samples, but is somewhat higher than Actual Behavior. Category 11 (showing tension) is below all samples, Category 12 (antagonism) continues below the level of the Bales samples, but shows a small increase over Actual Behavior.

The Role Playing Behavior profile may be interpreted broadly as follows: Having a set of assigned roles, the role players concentrated on

maintaining the action of the role playing. Much of the role playing chosen was in the category of problem discussion, and this served to inflate categories 5, 6 and 8, but since there was no necessary problem of coming to a group decision there is a relatively small amount of suggestion making. Tension did not appear to be high once the role playing began, and tension release and showing of solidarity are not high. It should be noted that the members have already spent a part of their time together getting acquainted. Somewhat more agreement is indicated in the Role Playing Behavior than in the Actual Behavior, indicating that the participants may be more than willing to take definite positions in the more permissive atmosphere of role playing. This is similarly reflected in the slightly higher amounts of disagreement and antagonism. While the Role Playing Behavior is apparently without the severe tension characteristic of the Actual Behavior, there is still evident a great amount of inhibition in the socio-emotional areas. This would indicate that while the subjects are able to participate with a relative absence of tension in the Role Playing Behavior, they have not become involved in a way which would require or permit them to show their spontaneous feelings toward each other.

The Air Force role playing shows a slight trend toward increase in the task-oriented categories which is similar to that of the Actual Behavior. Similarly, the socio-emotional categories show a decreasing trend over the sessions, and this is consistent for both the positive and negative categories. Loosely, this may be interpreted as an indication that the emphasis on "new" role playing situations and new roles for each session which appeared spontaneously in most groups required a great deal of information-and-opinion-giving on the part of role players. A premium was placed on developing the scene and the characters they wished to portray in terms of information and evaluation, rather than in terms of personal response to the other participants. The decreasing trend of positive responses, especially categories 1 and 2, may indicate an increasing autonomy or isolation of the role playing from the strains of the actual environing session. The decrease in the negative reactions is caused entirely by the decrease in showing tension, which is a rather remarkable drop. This would appear to reflect a facilitation or learning of the role playing or acting in the test situation. Somewhat less inhibition is indicated in the Role Playing Behavior than in the Actual Behavior, but the level of inhibition is still high. The second session "crisis" does not appear at all. The slight trend of increasing showing of opinion when the level of this category is already so high might be

interpreted as an increase in autonomy. In terms of *amount of total interaction* in the ordered sessions, while the data is not presented here, it should be noted that the amount increased consistently from the first to the fourth session. This again would appear to reflect a facilitation in the role playing.

This presentation has discussed several types of groups as observed by Interaction Process Analysis. The discussion has focused on changes in interaction patterns which appear to be factors of development of group structure, or of task and experience. In one case at least (the facilitation effect in the Air Force Role Playing Behavior) the part played by experience alone is indicated. Similarly, the part played by task becomes evident in the identification of the Air Force Actual Behavior sessions as high tension sessions. The importance of development of structure as a factor in pattern of interaction as observed by Heinicke and Bales is further demonstrated since the characteristic developmental trends they observed do not occur in the samples in which the development of structure does not occur.

Detailed clinical implications are not drawn here. However, it is evident that the study of group structure is vital to a rigorous development of group therapeutic approaches, as well as to the planning of groups constituted for special purposes. The emphasis of this approach is in description of the observed interaction patterns rather than on sociometric choice behavior. The relationship of these approaches has been indicated by Moreno[5] who has emphasized the importance of both for the understanding of the dynamics of the group.

[5] Moreno, J. L., *Who Shall Survive?*, Beacon House, Inc., 1934 and 1953.

THE INTERACTION-FEELING HYPOTHESIS APPLIED TO PSYCHOTHERAPY GROUPS

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In most discussion groups, expectations as to the role the leader will assume are rather fixed. In certain kinds of groups, however, the leader foregoes the customary directive control. In doing so he focuses his participation on defining the purposes of the group, clarifying the various roles adopted by the members and interpreting the significance of the roles for the activities of the group as a whole and for the adjustmental needs of its individual members. Since he provides no agenda and minimizes his moderating function, the group must develop discussion around themes they themselves select. In searching for acceptable topics the members test one another out through actions and reactions, learning those whom they like and dislike; identifying those by whom they seem to be accepted or rejected, and so on. This type of behavior has been treated extensively by sociometrists (18). In this course, a discussion based on this or that theme may develop and an exchange of some duration may follow, *or* topic after topic may be introduced but dropped or rejected before an acceptable theme is finally located.[2] This kind of cycle seems to be repeated over and over again in therapy groups and participation in such cycles is neither random nor determined solely by cognitive factors. Rather, it appears to be a manifestation of each member's emotional relations with others and with the group as a whole.[3] Understanding of the way members participate in these cycles constitutes a problem of considerable psychological significance.

Since most group therapy and many informal discussion groups are

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[2] For a description of this process see: Enneis, James M., "The dynamics of group and action processes in therapy," *Group Psychotherapy, 4,* 17-22.

[3] This point is emphasized by: Solby, Bruno, "Group Psychotherapy and the Psychodramatic Method," *Group Psychotherapy,* ed. J. L. Moreno, Beacon House, Inc., 1946.

variations of this description, the need for a tentative set of principles that will allow study of the interaction patterns which emerge in such situations is clearly indicated. The present paper centers on a consideration of the relationships that are likely to obtain between interpersonal feelings and rate of interaction under conditions of group organization like those just mentioned.[4] Though superficially opposite predictions seem to arise from the two different theoretical positions that are considered here, it is shown that introduction of a third variable permits one to view the two perspectives as consonant rather than contradictory. Based on the latter analysis, concrete predictions concerning the relationships actually expected to obtain in therapy groups are then made. Practical problems that must be faced in testing these predictions and the methods that produce the kinds of information required for their examination are considered in the final section of the paper.

Theory

There are many reasons for expecting the development of interaction between members in such groups to follow a dynamic course, and Moreno (18) was apparently the first to provide an empirical demonstration that some of the determinants involved could be measured with precision, and he has given considerable attention to the problems dealt with here. Rather than each person talking an equal amount with everyone else, a result that would keep the interaction level between all pairs more or less constant, the members of some pairs interact with one another a great deal, whereas little or no communication is exchanged between members of other dyads. Since interaction must be determined by factors in the situation itself, it seems proper to introduce this discussion by examining theoretical formulations that have been concerned with accounting for communication patterning.

[4] Two limiting conditions should be imposed on the range of relationships to which the hypotheses described in this paper are presumed to apply. First there should be no highly structured chain of authority which tends to force interaction into certain channels and away from others. For this reason relationships between the leader and members are not treated in the present paper. Only member-member relationships are dealt with here. Secondly, since no system can endure if the tensions within it are so intense that it is unable to move in the accomplishment of its goals, the relationships will hold only up to some point. Beyond this point the system will break up or the deviant individual or pair will either be brought into line or else rejected from membership.

The linear version of the interaction-feeling hypothesis.

A statement that provides a provisional account of communication patterning is summarized in what we shall call the *interaction-feeling* hypothesis. According to the basic conception, amount of interaction and degree of friendliness (like-indifference-dislike) should vary directly with one another. People usually come to like those with whom they interact, anticipate interacting with those they already like, avoid interaction with those they dislike. This has been treated by a large number of authors (Festinger, Schachter and Back (9), Caplow and Froman (6), Bovard (4, 5), Norfleet (21), Horowitz (11), Newcomb (19, 20), and others.)

The linear formulation, "if the frequency of interaction between two or more persons increases, the degree of their liking for one another will increase and vice versa," and the subsidiary hypotheses which support it, suggest that this general proposition is adequate to account for interaction behavior in a wide variety of interpersonal situations. But it is desirable to develop the implications of this formulation somewhat further. We might consider, for example, that the predicted relationships would be most likely to obtain when the pressures forcing one to maintain contact with the disliked person, either in a two-person situation or a larger group, are weak. In such cases the action consequences of dislike can be avoided in a more or less acceptable way simply by leaving the group or refusing to become "involved" in its tasks or with its members, outcomes that would result in interaction-reduction. When pressures to remain in functional contact with other group members are strong, the problem of hostile, negative feelings cannot be resolved so easily. Frequently such feelings seem to demand action. On the basis of the linear statement of the interaction-feeling hypothesis then, and for the reasons already mentioned, one would predict that even here subjects who dislike one another would either avoid one another or greatly reduce their rates of interaction below that characteristic for subjects who either like one another, or who feel indifferently toward one another. Yet it seems that such is often not the case. One may be provoked into interacting with another whom he dislikes quite as easily as he is drawn into interaction with one whom he likes very much. This kind of exception leads to important difficulties for the simple version. It means that interactions, which may have important consequences by intensifying through cathexis (7) or of weakening through catharsis the feelings dependent on them, are likely to develop in a way not predicted by the hypothesis. Since it does not provide an adequate allowance for these possibilities it

is necessary to examine certain assumptions on which it is based, with a view to its partial modification.

In its linear version the hypothesis assumes that an important aspect of affective response can be measured along a continuum ranging from strong dislike through feelings of indifference, to strong feelings of like. When scaled in this way, interaction is said to be positively associated with feeling; ". . . other things equal, the more positive the feeling the more frequent (or more intense, or richer, etc.) the interaction." This statement leads one to expect that under the general conditions set out earlier, feelings of indifference toward another person would be associated with an amount of interaction intermediate between the infrequent exchanges predicted for the dislike end and the frequent exchanges predicted for the like end of the scale. However, it is just this prediction which seems not to accord with the occurrence of antagonistic, aggressive or retaliatory behavior between people who dislike each other.

Looked at from another angle, the reasons for expecting a straight-line relationship between the variables of feeling and interaction, where feelings are presumed to range through a zone of indifference, are clear only for the case where the pressures to participate in group activities are weak. Given conditions where pressures on a member are sufficiently strong to insure his continued participation one might more reasonably expect, as has already been suggested, that heightened interaction would be associated with *either* positive *or* negative feelings. One would also look for infrequent interaction to characterize interpersonal relationships that are based on feelings of indifference.

The modified version of the interaction-feeling hypothesis.

These considerations suggest that a reorientation of the problem should involve analysis of the forces that are operating within the system as a whole. While a number of important antecedents of the viewpoint to be used should be mentioned (10), (14), (23), Parsons and Shils (22) have provided the formulation that will be followed here. Its basic proposition states than in certain respects the equilibrium of the social system as a whole can be treated as the product of the equilibria of the parts composing that system. It seems reasonable to maintain that the positive or negative feelings experienced toward another who has membership within the group constitute disturbances in individual affective equilibria, disturbances or stresses which generate actions directed toward their resolution. As Koffka

has indicated, ". . . in the field of k who is a member of the n who form the group, there exists a psychological group, a 'we,' and this part of the field is, for some reason or other, under stress. Then movement, behavior, will be started in such a way that it leads to a new field which is under less stress than the original . . ." (13, p. 653). This is equivalent to the more general formulation with respect to systems that maintain their form without significant change, ". . . if to a system in equilibrium a stress is brought, the system will move in the direction to counteract the stress" (11).

It is a basic proposition, then, that one of the major determinants of directed movement, or, in the group setting, of communication that is patterned, is emotional stress. If, as a first approximation, one equates positive and negative feelings with disequilibrium and feelings of indifference with equilibrium, and if conditions are such that movement out of the situation is difficult or undesirable, it is predicted that in this restricted setting interaction will take the form and direction that will serve ultimately to adapt or readapt the person with respect to that other group member toward whom the feelings are experienced. In other words, interactions would be expected to occur with greater frequency between those who either *like* or *dislike* one another than between those who feel indifferent toward each other. The reasons for this prediction are clear. If two people feel indifferent toward one another, it can be assumed there is little or no stress in their respective social fields which would provoke communication; here indifference implies a quasi-stationary equilibrium within one of the sub-systems of the whole. There is neither "need" nor "demand" for communication since B is not an affective stimulus for A, nor is A for B. In other words, by way of modifying the simple version of the hypothesis, it is here predicted that when pressures operate to keep members of a group together, the stresses that drive toward interaction will be stronger in *both* positive and negative feeling states than in neutral ones. This bears directly on observations made by Moreno on the theory of networks.

Comparison of the two versions of the interaction-feeling hypothesis.

When so interpreted the manner in which the stresses coordinate with positive or negative feelings will manifest themselves in overt behavior is predicted by both the linear and modified versions of the interaction-feeling hypothesis. No difficulties arise when positive feelings are involved; both versions predict a high rate of communication. When negative feelings are considered the predicted outcomes are at the opposite extremes of

interaction-frequency. Attention must, therefore, be centered on this aspect of the more general problem.

The reduced-contact notion, which underlies the linear version, apparently presumes that the stresses associated with negative feeling will be handled at the overt level (though not necessarily resolved) through restraint or avoidance-behavior. But in a situation where the pressures to remain in the group are strong, person B, who is a differentiated emotional stimulus for A, cannot be avoided in a physical sense. According to the simple hypothesis one might assume that he is either "ignored" or else adjusted to through self-restraint and inaction on the part of A. While such a "cognitive" approach may occasionally be adopted, it is often only a short-term solution. Negative feelings are likely to remain, or even to increase in intensity, thereby making maintainance of the "rule" impossible, with the result that contacts increase in frequency. This possibility, therefore, seems to lead into a more adequate account of the situation as outlined below.

The second possibility holds that when the pressures to participate in a group are strong, interpersonal stresses, either of liking or of disliking, will find outlet through contacts with the other person; in the first case through accommodation, in the second, through resistance (28). The reasons for predicting this latter result are clear if one looks on A's dislike of B as related to frustration, in the sense that B's behavior somehow endangers or threatens or reduces the likelihood of A's achievement of his goals. Such an interpretation is consistent with what would be predicted from the Frustration-Aggression hypothesis (8) (16). Granted that such a coordination of concepts is useful, it can be expected that the contacts which do occur will take a form that would serve to minimize the frustration; thus, from a clinical angle one sees the destructive side of aggressive behavior as serving adjustment through efforts which, if successful, would remove the agent of frustration or minimize its power to frustrate. At any rate it can be assumed that such contacts as do occur will characteristically take the form of hostile actions, of attacks, negative remarks, and so on. But without considering the *content* of interaction at this point, the prediction is that the sheer volume of interaction to be expected between subjects who dislike one another will be higher than the amount exchanged between subjects who feel indifferently toward one another.

One of the basic differences between the two versions of the hypothesis, that concerning the prediction of interaction-frequency for subjects who

dislike one another, is seen to disappear then, when the third variable, the strength of forces operating to keep members participating within the group, is introduced.[5] Now a rule that seems to relate the simple to the modified version can be stated, "the stronger the pressures operating to keep a member interacting with the group, the greater the likelihood his negative feelings toward others will lead him into interacting with them."

For a wide range of situations (where the pressures to remain as a group member are strong, where members are "equal" to one another, and where the leader foregoes control of the group in the superficial administrative sense) the relationship between feeling and interaction might, therefore, be better characterized by a U-shaped than by straight-line function. It could be stated verbally in the following way: "under conditions where the pressures keeping members of a group together are strong, the more the feelings that pairs of subjects hold toward one another depart from indifference—in either a positive or negative direction—the more likely interaction between them will be high, and vice versa." In the discussions to follow, this formulation will be referred to as the *modified;* the earlier one, involving the straight-line prediction, as the *linear* version of the interaction-feeling hypothesis.

Application to Psychotherapy Groups

Granted the reasonableness of these notions, a practical difficulty arises in trying to apply them in the analysis of the behavior of therapy groups. The problem stems from the artificiality of isolating A's emotional reactions to B from those held by B toward A. In other words, interaction or communication is a product of the interlocking attitudes existing within the group as a whole. At the very least, it should be studied from the point of view of *pairs* of members rather than from the totally superficial position of one person's activity considered independently of that of all the others in the group. Fortunately it is possible to make predictions that treat the joint or dyadic relationship as a unit. These are summarized in Tables I and II, and discussed in the following sections.

The case of shared feelings.

When two subjects share the same attitude toward one another; for example, when A *likes* B and B *likes* A, or when they both feel *indifference*

[5] The similarity between this variable and the concept of cohesiveness is immediately apparent. Thibaut (27) and others have formulated propositions comparable with the modified version of the hypothesis stated above.

Table I.

The Linear Hypothesis

Predicted relationships between interaction and feeling when forces to remain with the group are weak.

A's attitude toward B.	B's attitude toward A: Dislike −	Indifference 0	Like +
Like +	Average	Between high and average	High
Indifference 0	Between low and average	Average	
Dislike −	Low		

Table II.

The Modified Hypothesis

Predicted relationships between interaction and feeling when forces to remain with the group are strong.

A's attitude toward B.	B's attitude toward A: Dislike −	Indifference 0	Like +
Like +	High	Between low and high	High
Indifference 0	Between low and high	Low	
Dislike −	High		

Relative level of predicted interaction level shown in boxes.

or *dislike* for one another, no particular problems of application arise. Reciprocated attitudes of either *like, indifference,* or *dislike* should result in mutual reinforcement so far as interaction is concerned. The prediction would be the same for a dyadic as for a monadic prediction, though the total *volume* expected would be greater in the former case since the remarks by A addressed to B and by B to A would be combined into a single value. For the simple version an AB relationship of mutual *like* should be associated with high, and shared feelings of *dislike* should be related to a low level interaction. For the modified version of the interaction-feeling hypothesis and AB relationship of mutual *like* should yield high, one of *indifference* should produce low, and one of *dislike* should provoke a higher rate of interaction. These are straight forward predictions which offer no particular difficulties for experimental testing.

The case of unshared feelings.

The practical difficulty arises when subjects' attitudes toward one another lack mutuality. This is the situation, for example, where A *likes* B but where B's attitude toward A is either that of *indifference* or of *dislike.* Here the consequences of the joint effects can only be inferred by combining the *two* sets of feelings, one from the point of view of A toward B, the other from the standpoint of B toward A, into a single estimate of predicted interaction for the mixed AB relationship. Since the procedure of making a single estimate for the mixed AB relationships results in one set of predictions for the simple, and another set for the modified version of the interaction-feeling hypothesis, it is necessary to state the expected results for both versions. This is done below.

In terms of considerations elaborated on earlier, if the linear hypothesis is the more valid, positive attitude in A toward B associated with a neutral attitude in B toward A should yield a higher average for interaction than when the two persons hold attitudes of indifference toward one another but a lower value than when both subjects feel *liking* for one another. If A's attitude toward B is negative and B's toward A is neutral, the interaction-frequency should be lower than when two persons hold attitudes of indifference toward one another, but higher than when they share feelings of dislike. It is more difficult to specify the anticipated result when an attitude of like in one subject is combined with an attitude of dislike in the other. Still considering the linear version of the hypothesis, one might guess the effects would counter-balance one another, so that the interaction

average here would be in the neighborhood of that resulting from reciprocated feelings of *indifference.*

If the modified hypothesis is the more valid, different results would be predicted for certain of the cells as can be seen in Table II. Either a positive or negative emotional attitude on the part of one subject with a neutral attitude on the part of the other should result in a higher interaction rate than occurs in conjunction with a reciprocated neutral attitude; however, in neither case would one expect the values to be as large as when the attitudes of subjects toward one another are either both positive or both negative. Furthermore, the cell containing the positive attitude by A toward B with a negative attitude by B toward A (though this is a very unstable relationship which is probably undergoing change) should also have a higher value than that for the reciprocated neutral attitude since stresses in both subjects are driving toward interaction.[6] In other words, as has already been suggested, the combination of an attitude of indifference with an attitude of indifference should lead to the smallest amount of interaction of any combination under the modified version of the hypothesis. The results predicted from both versions of the hypothesis are summarized in Tables I and II.

Testing the Interaction-feeling hypothesis.

Accepting these tables as approximate summaries of interaction patterning under informal group conditions, how can the hypotheses to which they refer be put to empirical test?

It is clear that certain aspects of the theory can be tested through laboratory experiments. The effects on interaction of varying the strength of forces operating to hold members together, within the limits of variation feasible for laboratory experimentation, serves as an example of a part of the general statement that can be dealt with in this way. When forces to remain in physical or social contact with others are relatively weak, (i.e., the condition under which the linear version of the hypothesis would be expected to hold) the test can probably be made by using synthetic groups interacting under semi-laboratory conditions.

[6] This view will probably require modification because, when it is studied as a perceptual problem, this particular relationship is the most autistic of any in the table. Either negative feelings are not being communicated or the signals being released are not being interpreted. In either case these pairs merit intensive experimental and clinical study.

Given unusually strong forces to achieve goals that are controlled by the group, however, where the modified version of the hypothesis is probably more applicable, the studies that are indicated can probably be carried out most adequately with real groups where genuine feelings relate members to one another. Groups engaged in psychological discussions, psychotherapy groups for example, are probably ideal from this standpoint. But since no one investigator is likely to have access to the range of groups needed to test this hypothesis as a whole, the following remarks suggest the kinds of data required in order to validate, extend, modify, or reject the various parts of the general proposition.

Techniques useful in testing the predictions.

In *Who Shall Survive?,* Moreno (18) introduced the basic techniques for measuring interpersonal reactions. These continue to be among the most effective procedures yet devised for this purpose. Moreno's sociometric self-rating, recently receiving attention under the name *Relational Analysis* and described by Tagiuri in this Journal (25) also provides an excellent method for assessing the feeling tone of each of the dyads composed by members of a psychotherapy or other kind of "free" group. Although the method is new, it already has been shown to hold unusual promise as a technique for studying interpersonal behavior from an adjustmental standpoint. A forthcoming article based on this method, for example, shows that the perception of affect within 10-man groups is surprisingly accurate (26), a result which suggests that perceptual behavior is, at least under the conditions of that experiment, based on a valid assessment of the feelings of others. It is a procedure well adapted for providing one of the two kinds of data needed to test the Interaction-feeling hypothesis.

The scaling of molar aspects of communication patterning referred to as *Interaction Process Analysis* by Bales and his colleagues (1, 2, 3), is well suited for the purposes of measuring interaction under informal group conditions. While his method also allows differentiation of the *content* of interaction along a twelve category scale, present interest is limited to his rules for coding interaction *volume* into who-to-whom units. If these rules are used in conjunction with the self-ratings described above, the combination of the two methods would supply the data necessary for examining the validity of both versions of the interaction-feeling hypothesis.

Summary and Conclusions

The present paper has introduced a theory of interaction patterning sufficiently general to allow predictions concerning the relationships expected to obtain between affect and communication in "free" systems of the group psychotherapy type. The predictions are formulated in terms that allow empirical tests of their validity.

The presentation involved description of two superficially disparate views concerning the correlates of interaction patterning. They were brought into harmony by introducing a third variable, the dimension of the pressures operating to hold a member within the group. When these pressures are weak, it is predicted that the linear version of the interaction-feeling hypothesis will hold as an adequate basis for describing empirical data. When they are strong, however, it is expected that the modified version will prove relatively more adequate for predicting the interaction patterns that arise under "free" group conditions.

The matter of testing these hypotheses was then considered. After a brief analysis of the problems that arise in measuring feeling and in quantifying interaction, two procedures which should supply data adequate for this purpose were described.

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A SCALE PATTERN OF OPINION CORRELATES: COMMUNICATION NETWORKS, MEDIA EXPOSURE, AND CONCOMITANT RESPONSES

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In the course of analyzing 300 extended interviews with a controlled sample of Turks, a scale pattern of personal attributes was constructed. This was found to have higher predictive value for opinions expressed by the respondents over a wide range of questions than correlations between any single attribute and the opinion dimension. The typology appears to have more general interest than the particular distribution of responses in our sample. (Hence the relationships found are not here expressed in magnitudes, which, since our computations need to be extended and checked, would require more detailed discussion.) It is believed that the typology can be used for comparative studies of opinion formation in varied social settings, and that its main features may be applicable to a wide range of studies in comparative social dynamics. This study is related to prior work in communications and network theory as treated by Moreno, Lazarsfeld and Godet, Lerner, and others.

The research purpose was to set data on communication behavior and opinion formation in an ample social context, to illuminate recent trends within Turkey and to provide comparable data as between Turkey and other Middle Eastern countries.* As comparisons with respect to both time and place dimensions were desired, the questions had to be framed in categories that were sufficiently broad to accommodate minor variations but sufficiently stable to permit firm comparison. Accordingly, the interview schedule was designed on a "soup-to-nuts" basis, covering some 60 pages with questions that ranged over a dozen large categories and took 3-4 hours to administer. (The richness of the data produced by these procedures, incidentally, is a strong argument for what has been called a "fishing expedition" approach to areas of which the investigator is ignorant, rather than more precise "hypothesis-test" research designs.)

The sample was purposively controlled to over-represent the population of regular radio listeners. Any simple extrapolation from this sample to the population at large would have been misleading, particularly as the

* The project as a whole was administered by the Bureau of Applied Social Research at Columbia University.

Turkish population is composed mainly of non-listeners (the distribution being roughly in inverse proportions to the distribution in our sample). Moreover, the cleavage between listeners and non-listeners turned out to be deep, wide, and consistent along the entire continuum of responses in the opinion dimension. It was this cleavage, indeed, that led us to develop the typology which ultimately turned into a scale pattern.

In Turkey the development of the mass media system is rudimentary and the distribution of communication facilities is heavily unbalanced. The Turkish network contrasts sharply with, say, the American network on key socioeconomic factors. Here it is possible to say that practically everybody who wants one owns a radio set (even, by now, a TV set); there possession of a radio is still an important mark of socioeconomic status. Here the mass media are fairly evenly distributed throughout the land; there they are concentrated in the three large cities. Throughout the hamlets and villages of the vast Anatolian steppe there are practically no theatres, few radios, and even relatively little newspaper distribution. (The 1945 census reported over 70% of the population illiterate, as compared with an estimated 3% in the United States.)

In Turkey, there thus exist side-by-side a Modern and a Traditional social setting. The Modern setting includes a flourishing system of mass media; a corps of "communicators" (persons who make all or most of their living by operating the media system); continuous and comprehensive coverage of world events through the media system. In the Traditional setting the prevailing system of *oral* communication—face-to-face and mouth-to-ear—provides the enlightenment and entertainment which, in the Modern setting, people seek through the mass media. In any such oral system there are no professional communicators, the scope of events covered is greatly reduced, and the common focus of attention provided by the media is eliminated. Certain typical differences may be expected in the opinion processes of persons living in two such different settings.

Such differences did, in fact, appear very clearly as between the "pure" Modern and Traditional Turks. As we moved from the Ideal Types into our empirical results, however, certain lines began to cross. We found certain low-status persons with high media-exposure, whose opinions were akin to the Modern type; others in the same status category were closer to the Traditional type. An initial differentiation among these low-status persons was urban versus rural residence.

When this was done, however, we found that among the low-status, *rural* population there were significant differences in the opinion continuum.

Some differences could be accounted for by dividing this population between high and low media-exposure groups. But this still left a group which—in terms of status, residence, and media exposure—should have been identical with the pure Traditional type in the opinion dimension, but in fact was *not* identical. The most satisfactory way to account for this divergence turned out to be a personality variable. This provided the factor which completed the typology and brought the data into place.

The factor involved the mechanism of egoidentification. The Modern style typically is facile in handling the ego. Skill in self-projection is a mark of sophistication, and an enlarged capacity for ready identification in many dimensions is approved. The mass media system is a source of instruction on how to introject freely in a variety of situations. It teaches us to know the roles of others and how to assume them on appropriate occasions.

As compared with this expansive ego, the Traditional style typically exhibits a constrictive self. The approved patterns of identification are those fixed for each person, according to his station in the community, by tradition. "Self-manipulation" is regarded, to the extent that people are aware of it, as unworthy of any person with "good character". The ego is handled with little sense of possible alternatives, i.e. compulsively.

Between the facile introjection of the Modern and the compulsive identification of the Traditional our data revealed a range of projective capacities. Persons falling in this range we classified as Transitional Turks. By differentiating three categories within the range we were able to account for that group of Turks which, while sharing all the overt characteristics of the Traditional type (low SES, rural residence, low media-exposure), nevertheless ranks distinctively higher on the opinion continuum. This completed our typological structure and gave us the following set of scale patterns:

Type	SES	Urban	Media Exposure	Identification Facility	Opinion
Modern	+	+	+	+	1
Transitional A	—	+	+	+	2
Transitional B	—	—	+	+	3
Transitional C	—	—	—	+	4
Traditional	—	—	—	—	5

We may summarize the communication patterns of the Modern, Transitional and Traditional types as follows: Modern: High media exposure, mouth-to-mouth networks are supportive of media exposure and not the sole or primary means of communication of information. Transitional: Media exposure may be high, but is not necessarily so. Media exposure may be indirect through the mouth-to-mouth networks which are not only supportive but may be the important means of communication of information. Traditional: Media exposure low, communication of information is primarily through interpersonal relations and the mouth-to-mouth networks.

The extreme patterns are clear: the Moderns are high on status (SES), urban residence, media exposure, and facility in self-identification; the Traditionals typically are low status, rural residents, unexposed to the media, and incapable of identifying with varied roles and strange situations.

The middle range of patterns, naturally, are less sharply differentiated but still distinct enough to correspond with clear rank-ordering in the opinion continuum. All are low status, but the number and variety of their expressed opinions declines as we move from the urban to the rural residents; and decline further, among the rural residents, as we move from the high to low media-exposure groups. Degrees of exposure are not clear from the above patterns, where the variables are scored as dichotomous (+ or —) rather than continuous. But it is clear that the Transitional C group, with minimal exposure but some identification facility, scores higher in the opinion continuum than does the Traditional group. Concerning the role of this identification factor, then, a final word may be said.

For a substantial segment of the Turkish population, learning to handle the ego in other than Traditional ways appears to be a significant problem of daily life. The Transitional Turk has ruptured the compulsive mechanism that constricts his Traditional peers. But he is not yet capable of the Modern Turk's *introjective* technique of absorbing many and varied facets of a large environment by "adding" dimensions to his already capacious and multidimensional self. The Transitional Turk is slowly learning *projective* technique, familiarizing himself with strange roles and situations to the extent that he can make them resemble some part of the slowly-expanding self-image that he has available at any particular time. This varies among individual persons with their phase of development in the learning

process, which explains that utility of a tripartite division in the category of Transitional Turks.

The differences in behavior summarized by these labels appeared most clearly on a set of projective questions. Asked what he would do, for example, if he were President of Turkey, the introjective Modern was responsive, confident, even glib. He had opinions on all the large and varied issues of public policy, including some complicated problems of international affairs as the Korean War and the scope of American aid to different countries. The compulsive Traditional, at the other extreme, was nonresponsive, shocked, and even horrified at such questions. One gasped: "My God! How can you ask such a thing? How can I . . . I cannot . . . president of Turkey . . . master of the whole world!"

The projective Transitional responded in a range of intermediate ways. He exhibited neither the horrified silence of the Traditional nor the global facility of the Modern. On a narrower range of questions he did *have* opinions and *express* them. But these typically were opinions growing out of his personal experience, lightly mediated by a sense of possible alternatives. One responded that, as President, he would give top priority to building a network of roads that would enable provincial Turks to travel whenever they pleased to their fair cities. This turned out to be a village grocer who dislikes his rural life and loves to visit Ankara, only 30 miles away, but cannot do so much of the year because the dirt roads are impassable. No sophisticated talk of bipolar world politics here, but no compulsive silence either. Instead, there is some competence at projecting the self into imaginary roles and readiness to acquire more competence.

The same patterns of response appear consistently through the range of questions. To cite but one more example. When asked where he would live, if he could not live in Turkey, the Modern named some European capital (usually Paris). The compulsive and place-bound Traditional said he *could not imagine* living elsewhere. (Some extremists felt compelled to say they would commit suicide rather than live elsewhere—i.e. would rather destroy the self than attempt to project it into an unknown setting.) The Traditional, typically, thought neither of suicide nor of Paris. He could see alternatives but not too remote ones; his preferences were usually for nearby countries of the Middle East. The Transitional, in short, was learning to project imaginatively, but he was not yet stretching imagination too far.

We note, then, that in Turkey the life-styles of many persons are in

a process of change. In this change, access to the mass media is an interactive variable—conditioned by such factors as status and residence. It helps to articulate a social setting radically different from communities in which media exposure is restricted or absent. However, it teaches a skill—*having* and *expressing* opinions—which is a large asset in the changing society and hence is desired by many who have no access to it through given status and residence. Among these, persons are differentially equipped to acquire a share in this asset by their particular handling of the mechanism of identification. For those who are willing and able to acquire skill in manipulating the ego and expanding the self-system, the mass media act as teacher of the Modern style. The Transitional Turks are those who are learning, and thereby are moving into a way of life sharply differentiated from that in which they grew up. The sociological and psychological factors interact continuously in the process, and need to be handled in some such *systemic* relationship as is outlined in the typology here proposed. As the process is evident in very many societies in the world today, the typology too may be capable of wider application.

AN ANALYSIS OF THE PRIMARY GROUP

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Primary group phenomena may be analyzed by employing empirical variables although measurements of these variables need not always be made by observational means. The variables need only refer to some definable aspect of primary groups. It is here stipulated that a primary group is a pattern or temporal sequence of reciprocally selective human interaction involving learning. Within this stipulation, and for the purpose of this study, six variables are selected and their relative value as predictors of group intimacy is tested statistically, the question being which of the selected variables or properties describe and predict high intimacy groups with statistical significance.

The variables measured were: (1) size of group; (2) group's duration in time; (3) average frequency of contact per week of members; (4) average hours per week of contact of members; (5) age composition of group; and (6) sex composition of group.

PROCEDURE

Seventy-five graduate male students representing 25 fields of study were used in the sample. Each student was interviewed personally so that he understood the exact meaning of terms in the study and the nature of primary group phenomena. Then he was given a chart to be filled out and returned later. The chart requested him to specify the above mentioned properties of his own primary groups. In order to determine the order of "primariness" of his groups he was asked to rank them from most intimate or meaningful to the least intimate or meaningful. Table 1 is a copy of the chart.

The data were analyzed by dichotomizing each subject's responses into high intimacy and low intimacy information and taking the mean value. These values were selected for each variable and a 2 x 4 chi square contingency coefficient was calculated for each variable. The relations between the quantized variables themselves were calculated by means of a corrected correlation ratio.

RESULTS

The results of the six 2 x 4 chi square contingency calculations may be summarized as in Table 2. The exact upper limit of a 2 x 4 contingency

TABLE 1

	1	2	3	4	5	6	7	8	9	10	11	12
	No. of Members	Sex of Members	Age of Members	Duration of this Group (How long has this group persisted?)	No. of specific times or periods you interact with group per week.	Approx. total time you interact per week.	Are you a Dominate Member or a Member?	Approx. percentage of interaction you initiate for group.	Chief Purpose of Group.	Usual place of Interaction.	Does the group overlap with others in interaction?	Is there a larger Organization in the background to which group is related? If yes, specify.
1A Most Intimate Group												
2A 2nd Most Intimate Group												
6A 6th Most Intimate Group												

TABLE 2

Variable	Chi Square (Not Comparable)	2 x 4 Contingency Coeff. with a Maximum of Approx. .75
1. Freq. of Contact per week	77.76 sig. .001	.594
2. Hours of Contact per week	73.72 sig. .001	.59
3. Size of Group	20.4 sig. .001	.36
4. Group Duration	16.4 sig. .01	.33
5. Sex Composition of Group	10.42 sig. .02	.28
6. Age Homogeneity	1.55 not sig.	.11

table is not known, but since the same sized table is used throughout, the contingency coefficients are comparable.

The distributions of data for each variable are summarized in Table 3. This represents the range, mean, and standard deviation of the data collected from the 75 students.

TABLE 3

Variable	Range	Mean	Standard Deviation	Distribution Curve
No. of primary group affiliations	1-11	4.4	1.73	Normal
Group size	2-12	4.3	2.4	Two decay curves—odd and even nos.
Sex ratio	10%—100% (Males)	Not cal.	Not cal.	Bi-modal curve—all male and half male
Average age deviation from mean age of group members (including parental groups)	Less than 6 mos. to 15 yrs.	3.99	4.7	Skewed heavily to lower values
Group duration in years	Less than one year to 12 yrs.	2.8 years	2.7	Skewed to lower values
Frequency of contact per week	1 to 25 times per week	4.6 times per week	5.36	Highly skewed
Hours of contact per week	1 to 30 hours per week	6.8 hours	8.4 hours	Highly skewed

Correlation ratios between some of the variables are represented in Table 4. The corrected correlation ratio or epsilon (ϵ), which is represented in the table is similar to an r correlation. Only two correlations were found to be significant.

Discussion

The data compiled represent all types of primary affiliations such as family, parental, friendships, courtship, and others. Moreover, the student specified the purpose of each group. There were seven major purposes given. They may be listed in order of their frequency of occurrence as follows: social (109), family (95), work (33), intellectual or discussion (22), friendship or companionship (19), study (17), and sports or hobbies (11). This is not necessarily a taxonomy of group purposes but indicates

TABLE 4

	Average Size	Total Frequency	Average Frequency	Total Hours	Average Hours
No. of Groups	= .20 Not sig.	= .29 Not sig.	= .49 (sig. 1% = .41)	= < 0 Not sig.	= .61 (sig. 1% = .41)
Total Hours per Week of Contact		= .10 Not sig.			
Average Hours per week of Contact			= .22 Not sig.		

the possibility of a more selective analysis of different group types. Such variables as age homogeneity, and duration of course have different meaning when applied to parental groups than to recreational or courtship groups.

The results of the study indicate that the frequency of contact and hours of contact per week have by far the greatest predictive value in describing "intimate interactions." Since these variables themselves did not correlate significantly they may be considered as relatively independent.

There is one finding which may be important for research in group work or therapy; that being the number of groups a person has contact with. The number of primary groups an individual is affiliated with is usually 4 or 5. The fact that one may know the number of primary groups a person has does not predict the total frequency of his contacts per week. This fact, however, does permit a fair prediction of the average frequency of contact and the average hours of contact of all his groups. The important point, however, is that people with as many as 6 or 7 groups have on the average only slightly less contact per group as those with only 2 groups. This is based on the average hours per week and the average frequency of contact per week.

The last point of interest is the factor of group size. The great bulk of human interaction is dyadic in nature. This is shown not only in this study but also in the observational work of James.[1] As the size of the group increases the frequency of its occurrence decreases in a typical decay

[1] John James, "A preliminary study of the size determinant in small group interaction," *Amer. Soc. Rev.*, August, 1951, p. 474.

curve. The difference between these results and those of James is that two decay curves are found in the present study, one for even sized groups and another for odd sized. Presumably larger groups gain greater stability by breaking up into smaller groups or those of an even numbered size.

The reason one variable is a more accurate predictor of group intimacy than another is a psychological question. Since a primary group was considered as a pattern or sequence of selective interaction with perceptual learning, this learning may be included within the general problem of human cognition. Some postulates made by Postman[2] may be suggested as relevant. Postman conceives of a perceptual organization or structuring as an expectancy.[3] Primary group interaction may then be viewed in terms of the stimulation and confirmation of auditory, visual, and associational expectancies. There is experimental support to the postulate that the strength of an expectancy depends upon the frequency with which it has been confirmed in the past. This would show agreement with the frequency variable which was most significant in this study. There are cases, however, where this variable and perhaps the duration variable, do not hold as a predictor of intimacy. In such cases it may be postulated that the stronger the motivational support given for an expectancy the less stimulation or information is required to confirm it. Thus the "love at first sight" idea. Also, some groups become intimate or primary in very short periods of time without necessarily involving great motivational support. Here it may be suggested that the more firmly or widely an expectancy is associated in the larger cognitive organization the less information or stimulation is required for confirmation.

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[2] Leo Postman, "Toward a theory of cognition," *in* J. Rohrer and M. Sherif, *Social Psychology at the Crossroads* (New York: Harper and Bros., 1951).

[3] This is undoubtedly based upon neuro-dynamic processes.